A NEW SPECIES OF *TATERA* FROM TANZANIA WITH A DESCRIPTION OF ITS LIFE HISTORY AND HABITS STUDIED IN CAPTIVITY

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The orange belt of Tanzania centres about the small African town of Muheza which is 25 miles inland from the Indian Ocean at 5° 10′ S, 38° 47′ E. The elevation is 600 feet. One might consider the area a giant oasis. It is highly agricultural. The climate is hot in the hot season, warm in the cold season and rains keep the vegetation green throughout the year.

One mile west of the town there is a slight ridge, along which the road runs. The holotype and allotype of a new species of *Tatera* were collected from a grove of palms to the left of the road, but no burrows were found here. To the right in the midst of dense cultivation is a five-acre patch which has never been cultivated; an area of tangled, green, waist-high grass, with here and there a bush. This patch is the home of the Black gerbils of the orange belt of Tanzania and from it seven female and three male paratypes were taken.

TATERA PRINGLEI sp. nov.

The mouse considered here is new and undescribed and shall be called *Tatera pringlei.*

This is the first black backed, short-tailed gerbil to be described from Tanzania and the first new gerbil to be described from the country in 35 years.

Holotype (No. T2710): An adult male, skin and skull, taken at Ubweri village, Muheza, in north east Tanzania on 17 July, 1965.

Allotype (No. T2741): An adult female, skin and skull, taken at Ubweri village, Muheza on 21 July, 1965.

The types, skins and skulls, are deposited in the U.S. National Museum.

Paratypes: Collected as for above during October, 1965. Four in skins, six held in captivity. (See Table 1.)

Description of Holotype male: A large dark coloured (almost black) gerbil with a short tail. General colour black speckled with light brown. Hair on nose black with black extending up between eyes to expand over eyes, then decreasing in width between ears; then fairly black, with a few tan hairs down the middle of the back to the base of the tail; the light brown hairs becoming more and more numerous until, where the sides meet the white of the belly, the black hairs disappear and the light brown hairs take over completely. Cheeks brown with black hairs immediately below and behind eyes. Tail tan below, slightly darker above and sparsely haired.

Measurements: Total 300, Head and Body 170, Tail 130, Hind Foot 40, Ear 18, Scrotum 50, Testes 25 (measurements in mm).

Skull:	Greatest length	41·3 mm
	Condylo-basal length	38·4 mm

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Basilar length	32·3 mm
Zygomatic width	22·6 mm
Bullae length	11·6 mm
Diastema	11·6 mm
Molar tooth row (alveolar):	
upper	7·1 mm
lower	6·6 mm
Width of M^1	2·3 mm
Interorbital constriction	6·5 mm

Molar wear: slight plus to moderate.

General description: Tatera pringlei is a large bodied gerbil with a short tail, the tail being equal to the length of head and body but usually shorter, seldom longer. The belly and feet are pure white, the lower sides tan but the back varies in colour with age. Young mice, before their first moult, are dark grey above; prime specimens during their first breeding season, jet black from tip of nose to base of tail; the back becomes progressively less black with advancing age. The ears of the gerbil are erect, pinkish, almost naked, the nose is pointed, the cheeks are not prominent, the whole head giving the mouse an alert, interested look. The short tail is blackish above, tan on the sides and below. This gerbil is blacker, larger in head and body length and shorter in tail length than any gerbil so far described from East Africa. The skull is much broader at the eye sockets and shorter in length than that of other gerbils. Mammae $1 - 2 = 6$. Measurement of types and paratypes are given in Table 1.

This gerbil bears the name of Dr. Gordon Pringle, Director of the Malaria Institute, Amani, Tanzania, through whose kind offices the writer's three years' study in East Africa was made possible.

HABITAT. The Black gerbils are known only from the type locality, the small five-acre patch of waist-high grass at Ubweri Village, Muheza. The holotype and allotype were taken not more than 1,000 feet away in a coconut palm grove where they had probably wandered in search of mates for the male was in full rut with scrotum 50 mm long and testes 25 mm and the female's uterus was swollen and filled with a colourless fluid.

The waist-high grass of the five-acre patch is not typical of the habitat of a gerbil. There were no noticeable trails in this grass jungle so the mice for the most part must have progressed on all fours, and, being built like an American Kangaroo rat for hopping, this must have been a tolerated inconvenience. The soil of the five-acre tract is rich, black, sandy and moist. The Ubweri Village rain gauge is about 100 feet from the grass patch and measures 52 inches of rain a year. It is unusual for gerbils to live where there is this much rain. The upper coat of this gerbil is black to match the black soil but where these mice find dry dust with which to groom themselves and keep their white bellies and feet spotlessly clean is hard to say. Perhaps another cleansing method is employed.

The Black gerbil is locked in the oasis which is Muheza, for this fertile area quickly becomes African dry bush in which there is so little moisture that even sisal will not grow. But it is this dry surrounding country, which may extend for miles, that is one's conception

TABLE 1

LIST OF SPECIMENS USED IN THE STUDY. TWINS-TRIPLETS REFER TO YOUNG BORN IN CAPTIVITY. OTHER REMARKS REFER TO STATE OF SPECIMENS ON CAPTURE.

F. No.	*Date*	*Sex*	*H.B.*†	*Tail*	*H.F.*†	*Ear*	*Remarks*
T2/10	17. 7.65	m	170	130	40	18	Holotype
T2741	20. 7.65	f	165	140	38	20	Allotype
T2976	5.10.65	f	170	140	40	20	Paratype
T2977	5.10.65	f	170	145	40	22	Paratype
T2977a	5.10.65	f	140	130	35	20	Paratype
T2981	5.10.65	f	155	130	35	20	Paratype (Twins)
T2982	5.10.65	f	150	130	32	19	Paratype (Twins)
T3005	20.10.65	f	160	130	35	20	Paratype (Twins-Triplets)
T3006	20.10.65	m	165	120	35	18	Paratype (Full Rut)
T3007	20.10.65	m	160	135	30	18	Paratype (Very Old Male)
T3008	20.10.65	m	170	130	35	20	Paratype (Full Rut)
T3027	4.11.65	f	145	120	35	20	Paratype (Twins)
T3034	5.11.65	f	155	130	35	20	—
T3300	22. 3.66	f	145	No T.	35	18	Very old, released
T3027a*	15. 4.66‡	f	160	120	35	18	(Twins)
T3027b*	—	f	—	—	—	—	(Twins)

*Born in captivity 7.11.65 to female No. T3027.
†H.B.= Head and body, H.F.= Hind foot.
‡Date of death when measurements were taken.

of true gerbil habitat; so one finds to the south, east and west *Tatera robusta swaythlingi;* to the west *Tatera r. vicina* and *Tatera nigricauda nyama* and to the north, after one leaves the Eastern Usambara Mountains and on up into Kenya, the old *Tatera mombasae* which, as early as 1919, was declared a synonym of *T. r. vicina.* Thus the Black short-tailed gerbil is surrounded everywhere by *robusta*, tan coloured, long-tailed gerbils.

THE BURROW: The burrow of the Black gerbil is more organised in structure than that of most other gerbils. The general run of gerbil burrows consists of a number of entrances and escape hatches and an irregular system of anastomosing tunnels. The Black gerbil's plan is orderly (Fig. 1). There is a front porch, a tunnel, a rest chamber, an antechamber, a nest cavity and an escape tunnel. The front porch leading to the entrance consists of 12 to 18 inches of the burrow with the roof removed and with the sides well packed. This portion is scoop shaped and so built that the owner could dive in from any direction if pursued. At the base of the porch the tunnel entrance is about three inches in diameter, while the mouth of the scoop may be five inches. The burrow itself is simple, being a single tunnel about two inches in diameter, smooth walled, rounded floor, usually very straight and up to 16 feet long with a nest cavity and antechamber two-thirds of the way along it. Usually there is one rest chamber which is a two foot branch off the main tunnel and which does not rise to the

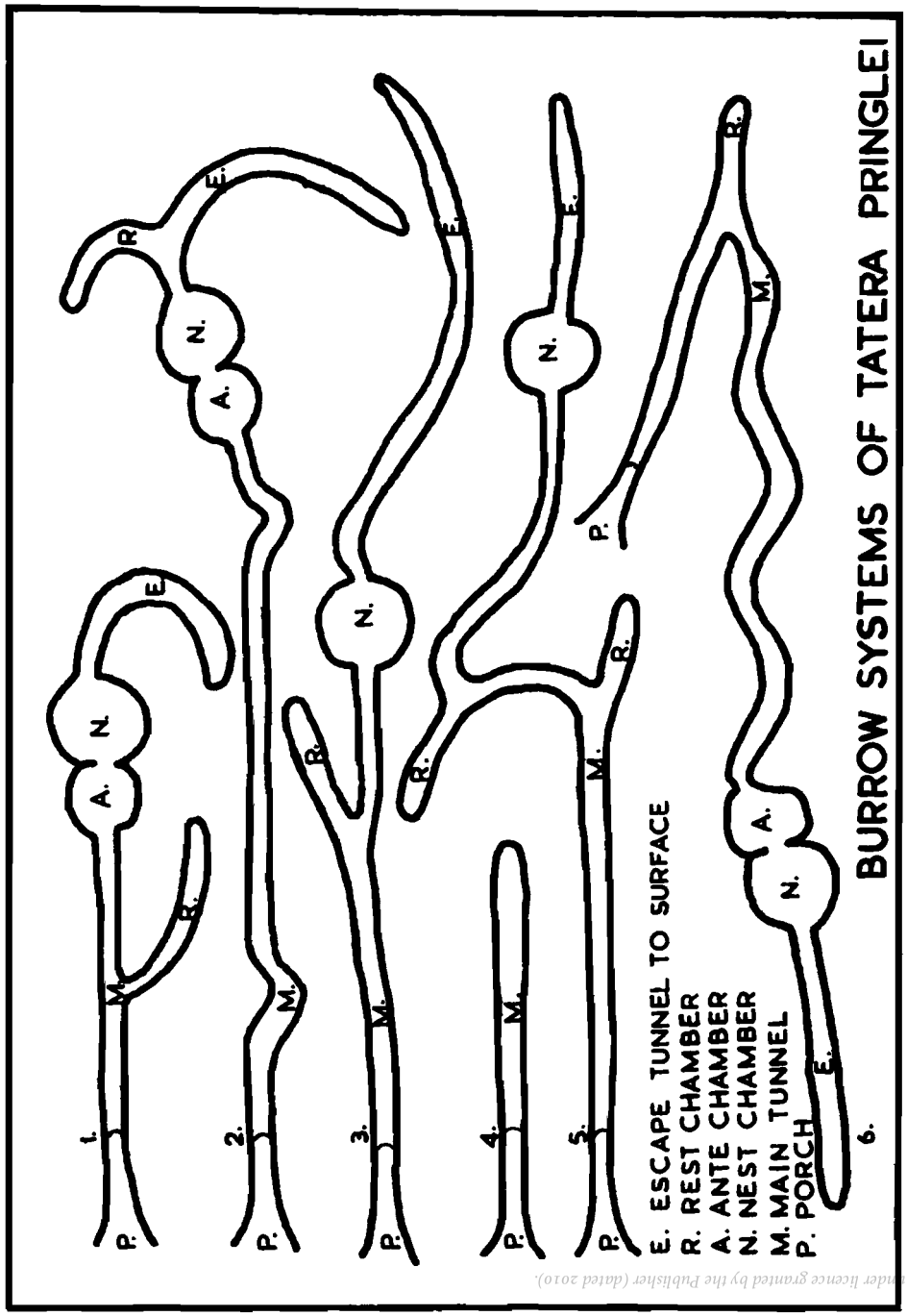

FIGURE 1
Illustrating the burrow systems of *Tatera pringlei*

surface. No food or debris of any kind is found in this side tunnel. The nest cavity is 10 inches in diameter and the antechamber, if present, is immediately before the nest chamber and about eight inches in diameter. These two chambers are from 12 to 24 inches below the surface. The entrance to the nest chamber is about midway up and opposite this is the escape hatch which may run six to eight feet gradually rising to the surface where it may not quite break through, or if it does, close grass covers the opening.

In all burrows excavated the owners were away, possibly in detention by the writer. No evidence of tunnel plugs were found in the systems. This may suggest a difference with the Kangaroo rat which usually kicks sand into the burrow entrance when retiring. However, in captivity the Black gerbil always closes its nest box entrance with litter debris but this may simply be to shut out the light, there being no tunnel to hold the light out of the nest.

There is no pile of excavated dirt at the front porch as is the case in many gerbil households, so the soil must be moved away and scattered in the neighbourhood. The Black gerbil, like other gerbils, claws the dirt free with the sharp nails of the fore feet, scoops it under the belly where the large back feet kick it to the rear. In so far as gerbils have no cheek pouches nothing can be transported to or from the burrow by this means. They are, therefore, not hoarders and the burrows contain no food stores. The nest is placed in the nest cavity so that the owner simply steps out of the burrow into it; no climbing is necessary. The pallet is four to five inches thick and is made of dry, springy, coarse grass, unchewed. There is a depression in the centre which fits the mouse's body.

HABITS. The Black gerbil, like all gerbils, is nocturnal and terrestrial. They are not successful climbers but will attempt to climb about the wire of a cage. There is little doubt that each gerbil has its own burrow but in captivity numbers will sleep together even though sleeping quarters are furnished for each.

Faecal pellets of the Black gerbil were never found in the field. It is indeed unusual to find the faecal pellets of any gerbils. The writer has uncovered evidence which leads him to believe that gerbils bury their faecal pellets. At Gonja there is a fairly dense population of *Tatera r. swaythlingi*, *T. r. vicina* and *T. n. nyama*. The climate is dry. The terrain is flat. During the hottest and dryest season of the year when the surface soil is baked hard and the gerbils have difficulty digging through it there are found accumulations of something like 12 faecal pellets stacked up in neat piles, like bricks in the small open spaces where they are active at night. The mouse then scratches the hard soil with its sharp front nails, leaving the scratch marks in the hard crust and kicks the loosened particles of soil over the neatly piled pellets, but becoming discouraged at the hard nature of the soil leaves the job half finished to go on its way. During the non-dry season the pellets would be actually buried so are never seen. This could be the case in the Black gerbil too.

When angry, startled or frightened, gerbils, like Kangaroo rats, bounce their large back feet up and down in a rapid noisy tattoo.

In captivity, five-week-old young females will shred turkish towels (thrown over their cages for privacy) and use this to build nests resembling birds' nests for themselves. The males of this age are not so inclined.

It is probably pure coincidence that at the home of the Black gerbil all male specimens

secured were taken at the upper portion of the slope, all females at the lower portion.

DIET. In comparison to other gerbils, the Black gerbil drinks large quantities of water in captivity. This would suggest that the surrounding green grass formed a large part of their diet, since it does not seem likely that they would move down to the nearby creek to drink. Gerbils, unlike Kangaroo rats which suck water from drops held in their hands, lap water with their tongues like other mice. The general run of East African gerbils do not have water available to the same extent that the Black gerbils do, so these probably, like the Kangaroo rat, secure their necessary water requirements from the water hydrathodes of desert plants and other sources such as metabolic water.

In captivity the Black gerbil prefers quick cooked rolled oats to other foods suggesting that they are normally seed eaters. The hard nature of the faecal pellets of recently caught specimens suggests that woody tissue and bark may be eaten. Detained Black gerbils enjoy sliced orange. Insects of all types are eaten readily.

DISPOSITION. There is little doubt that temperament is an individual trait in mice. However, some species are more aggressive than others. The little striped *Rhabdomys* will bite a finger without compunction and it is unusual for it not to bite while, on the other hand, the goliath of all mice, the Giant rat *Cricetomys* can be grabbed by the tail, pulled out of a trap and it stoically waits to see what will happen next. The Black gerbil is generally gentle and can be handled without trouble. Like the Kangaroo rat, they tend to kick and scratch rather than bite. Only on one occasion was the writer bitten, by a virile male while the mouse was being anaesthetised with chloroform. This male, introduced into a cage of females, met with hostility for several days. The females were distinctly aggressive towards him but in the end he was sleeping in the same nest box. After three months of confinement a female (No. T3005) took exception to her five companions and attacked them constantly. She was removed bare handed and made no attempt to kick, bite or scratch and peace was restored in the cage. It is unusual for gerbils to maim one another in captivity but occasionally they will chew each other's tails. They also resent strangers for a while. No doubt the males fight amongst themselves during the mating season.

BREEDING

Courtship. The courtship of the Black gerbil and presumably other gerbils is not elaborate. On the evening of 23 February, 1966, a young 110 day old female raised in captivity, was alone in the detention cage with a male that had been in detention for 125 days. At 8 p.m. the courtship began. The female nudged the male several times then ran with the male in pursuit. She would stop suddenly and the male's nose would naturally bump her in the rump, then she would move on. This went on for about five minutes and then the female stopped and did not move on. The male simply grabbed her thighs with his forefeet and in a minute the mating was over. The female quietly went about her business but the male was inactive for an hour. In cases where the female is not receptive to the male's advances she becomes hostile towards him, attacking whenever he shows himself. If he persists she will kick sand in his face when he comes within range.

Embryo counts. All the writer's embryo counts for gerbils captured in north-east Tanzania are in the month of December. In Kenya Heller had a record for December and Loring found a pregnancy in late November. In captivity the picture is different.

Births. Seven females gave birth in captivity. Growth data were collected chiefly from the first set of young (Table 2) and observations on the general behaviour of mother and young were made chiefly on the second set.

1. Female No. T3027, when captured on 4 November, 1965, appeared to be pregnant. She was placed in a detention cage and immediately made herself comfortable in a cardboard box filled with grass from a dug out nest. On the morning of 7 November it was noted that she had tightly plugged her doorway with grass and on removal of this plug one robust red, naked, blind youngster, helplessly kicking on its back was seen. New born gerbils have extremely short tails and very small ears and feet. It was also noted that the mother was terribly restless the entire day and kept drumming her back feet against the floor of the nest. She was later found to have two young. One of the new-born young was measured: Total 60, Head and Body 45, Tail 15, Foot 8, Ear 2. Compared with the young of other gerbils of which the author has first-hand knowledge (*Tatera robusta vicina* and *T. r. swaythlingi*), this is rather large for a new-born gerbil being a little less than one-third the length of the mother. At five days the backs were clothed in soft grey hair, the bellies were still pink, the heads looked monstrous because they were broad and the closed eyes bulged out of the eye sockets. The little mice, which could now creep weakly, noisily resisted handling. They now measured 75, 55, 20, 8, 3. At ten days they were even more noisy; they measured 103, 65, 38, 18, 5, the hind feet and tail having far outgrown head and body and ear. The fur on the back and tail was now blackish grey, the belly and feet pure white. The young mice were now creeping actively and resisted attempts to confine them for measuring.

From the 10th to the 15th day growth was steady but not accelerated. Between the 15th and 20th day growth was phenomenal. The eyes had now opened and the young were about two-thirds the size of the mother. They were still nursing, the mother dragging them around anchored to her when they refused to let go. They now measured 150, 92, 58, 23, 10. Growth data have been summarised in Table 2.

At 22 days the mother died and the young, unaware of her death, continued to suckle for some time. A post mortem showed that the ends of her long bones had become demineralised. She had apparently mobilised the minerals of her bones to support lactation. The young were raised successfully showing that they can survive without milk from this age. The actual weaning age in the wild is not known.

2. Female No. T3005 (captured October 20, 1965). On the evening of January 8, 1966, she became aggressive and caused a serious disturbance in the Black gerbil cage. When placed in another cage she immediately quieted down and started to construct a nest from fine grass in the cage corner. At 4 p.m. the following day two young were born. These must have been conceived in captivity the mother having been in detention for 70 days. The measurements of this second set of young corresponded closely to that given in Table 2 for the first set.

TABLE 2

GROWTH CHART OF BLACK GERBIL *TATERA PRINGLEI*. TWO YOUNG BORN 7.11.1965 AT AMANI, TANZANIA. MOTHER: FEMALE NO. T3027 TAKEN AT MUHEZA 4.11.65.

	Total	*H.B.*	*Tail*	*Foot*	*Ear*
Mother	265	145	120	35	20
60 days	220	130	90	32	17
55 days	210	125	85	31	16
50 days	202	121	81	30	15
45 days	194	117	77	29	14
40 days	186	113	73	28	13
35 days	178	109	69	27	12
30 days	170	105	65	26	11
25 days	162	101	61	25	10
22 days		Mother dies			
20 days	150	92 Eyes open	58	23	10
15 days	115	70	45	22	10
10 days	103	65	38	18	5
5 days	75	55	20	8	3
Birth	60	45	15	8	2

During the first 12 days after birth the young, when returned to their cage after being measured, simply rested quietly until their mother came out to retrieve them. Their nest was three inches high so the mother would either grab them by the nape of the neck and place them in the nest or tumble them end over end up to the top of the nest edge and allow them to roll in. On the 13th day after birth, for the first time the young showed fear and bewilderment. They were up on all fours and dashed blindly about the cage. The mother rapidly retrieved them. On the 14th day the young were sitting up beside their mother preening their noses and nibbling food particles. On the 15th day the youngsters were trying to hop gerbil fashion, but this is something they apparently must learn for at first they simply bounce up and down before eventually learning to hop forward.

At about this time the mother allowed the young out of the nest for short periods to play and though still blind they would bounce about engaging in sham fighting and sampling food. At 16 days the young were strong enough to get into the nest by themselves. It was during these play days that the writer realised that the antechamber in the burrow was a play nursery for the young. The mother could place them there safely, the entrance being sufficiently high to prevent the young from finding their way out. At 16 days they were still blind and still nursing. Their grip on the teats was so great that when the mother was picked up the young were lifted right out of the nest with her. It was also noted that young gerbils communicate with their mother constantly when they are not asleep. She was never heard to answer back.

At 19 days the little female had one eye half open and by 21 days she and the young male had their eyes wide open. It takes a day or two before the newly-opened eyes can be used and with their use fear becomes very marked. It is then almost impossible to handle the young mice until they become accustomed to moving shadows.

3 and 4. Females Nos. T.2981 and T2982 gave birth to two young each on February 1, 1966, after having been in detention since October 5, 1965, or about 115 days. The growth of the young was remarkably constant and like that given in Table 2.

5. Female No. T3005. On February 8, 1966, when her first set of young was one month old she was removed from them and placed in a large detention cage with a male. Sixteen days later the female was removed from the male's quarters and on the 25th day after being placed with him she produced a family of three.

On the day these triplets were 30 days old the mother was again placed with the male in an attempt to produce a third family. Two nights later the three young, apparently looking for their mother, managed to escape, and one of them died from exposure. Eight days later the mother was returned to the remaining two. One would have thought the young would have forgotten their mother in the 10 days but for hours they romped over her, nibbling her ears and tail and grooming her fur. The mother, in turn, groomed the youngsters' fur, gerbil fashion, running the silky hair through her front teeth.

6. Female No. T3027a (born in captivity to female No. T3027). On February 23, 1966, when she was 110 days old she was placed with a male and noted to copulate with him at 8 p.m. on the 26th. On March 21 she produced a family of two. This suggests a gestation period of 23 days.

FIGURE 2
Tatera pringlei: From left to right (top) the mother, two months, two weeks, two weeks, two days, the nest. (Bottom) burrow entrance, type locality.

7. Female No. T3027b (sister of T3027a) was placed with a male on March 1, 1966. After behaving aggressively towards him for four days she deserted her nicely constructed nest to sleep with him in his rather poorly built home. She was removed to a detention cage on March 6 and had a family of two on March 25. This confirms a gestation period of 23–24 days for a first litter of *Tatera pringlei.*

PLAGUE AND PARASITES. Speaking of gerbils in general, these mice have been consistently and continuously associated with plague. The Black gerbil, however, comes from an area where plague has never been reported. Fleas have never been found on some 1,000 mice of various kinds collected at Muheza throughout the year. The Black gerbil is no exception.

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SUMMARY

Tatera pringlei sp. nov. is a black backed, short tailed gerbil with white belly and feet which lived in a colony at Muheza, Tanzania. After taking twelve specimens and digging out six burrows, the colony seems to be depleted. The mouse is nocturnal and terrestrial; omnivorous and highly insectivorous. Its burrows are simple, precise and clean. Females are gentle, even when with young. First young, born as twins as early as 125 days of age, while litters of three may follow in about two months. Gestation period close to 23 days. Breeding stock now (March 30, 1966) on hand six females with young and a mature male. This gerbil known only from type locality although the writer has trapped all over the Republic of Tanzania.