

Fourie (1936) has definitely established that their dung is composed entirely of fur during the height of an epizootic among gerbilles and that it becomes normal again after the subsidence of mortality. The Public Health authorities now recognise, that when rodent fur is found in the excreta of the yellow mongoose it is an indication of plague or some other epizootic affecting small rodents.

Fitzsimmons states, that they at times attack and devour larger prey and do not hesitate to follow ground squirrels down their burrows to attack and kill them. This is probably not quite correct. I have seen a squirrel attacking and driving a yellow mongoose away from her warren, into which the mongoose endeavoured to escape when it was fired upon. He further states, that it is not uncommon to find a pair of these meercats in possession of a warren of a "jumping hare" or a ground squirrel, the rightful occupants having been either devoured or driven out. From careful observations it has been found, that the yellow mongoose will occupy warrens side by side with these animals without disturbing them.

It has been reported on several occasion, that they attack newly born and weak lambs, and they do not hesitate to devour after-births. As a result of the damage they do to sheep farmers they have been declared as vermin, and three-pence is paid by the Freestate Provincial Administration for each Cynictis tail presented.

The Cynictis is mainly diurnal in habit, but has frequently been observed at night. It hunts either singly or in pairs but not in groups, and it may wander as far as two miles from its abode in search of food.

They usually live in colonies of anything from two to ten or more individuals, but a family usually consists of from two to five. The females usually give birth to two young at a time, and probably more than once during the same

breeding season, as females in full lactation have been found to be pregnant as well. A pair of well fed young mongooses do not look unlike two well fed puppies.

Suricata suricatta.

English : Cape suricate; common meercat; slender-tailed meercat.

Afrikaans : Stokstertmeerkat; gewone meerkat; graaitjie.

Sesuto : Letoli.

Sechuana : Kotoko.

Five geographical varieties are listed by Roberts. The genus Suricata as in the case of Cynictis belongs to the sub-family Herpestinae of the family Viverridae.

Distribution.

The suricate has more or less the same distribution as the Cynictis. Its distribution in the Cape Province is however more restricted.

Being essentially a Karoo animal it does not approach the east coast as close as the Cynictis, and do not therefore occur in Kaffraria. Its extension is more south and north than the Cynictis, occurring as far south as Ceres. It is found on the central high veld of the Transvaal, Orange Free State, Griqualand West and Bechuanaland. Several large colonies have been seen in the Kalahari region of Kuruman district. In South West Africa its distribution is very limited and occurs only in South Damaraland and Gobabis district. Unlike Cynictis the distribution of Suricata is very even throughout the area where it occurs.

Habitat.

The suricate, having strong curved front claws, is not like the Cynictis dependent on the Geosciurus for its warrens. It digs its burrows out in exposed places, preferably on slight elevations to prevent storm water from entering into its warrens.

It is, however, not usual to find the suricate occupying the same warrens as the Cynictis and the Geosciurus. The warrens in this case were probably dug by the latter species.

The suricate is much more migratory in a given locality than either of the other two species of animals, i.e. it wanders within a localised area from colony to colony at short intervals. A large colony was observed near Oliphantshoek, close to a big Camel thorn tree, along the main road to Kuruman. At times there would be no signs of habitation and at other times the suricates would be found there again.

The suricate is the most gregarious of the viverrids and families consisting of ten to thirty or more members are quite usual. In one case on the Trompsburg Commonage a troop of some forty were counted living in one colony.

The migratory habit is probably a necessity to a family of suricates, as they do not wander very far from their warrens in search of food. It, therefore, stands to reason that with a large family traversing in a limited area only in close proximity to its warrens, the food supply would soon become exhausted, whereupon the family has to find a new hunting ground and consequently also a new colony.

Two instances have been described where a migratory troop of suricates have been followed for some distance. In the one a member of the South African Police on patrol duty on horseback in the Bethulie district followed a troop of some thirty strong for about two miles along the road. At a turn of the road the suricates carried on, while the police constable turned off. On the farm Elladale in the Umvoti district, Natal a pair of suricates brought from the Free State as pets, escaped into the veld where they soon multiplied into quite a large family. The farm is situated in the mist-belt, where suricates do not occur. At least two places were known about a mile apart where this family had burrows, which were occupied at different intervals. When one colony

was inhabited the other seemed to fall into disuse, but when its turn of occupation arrived fresh excavations were to be found into which the troop would escape on being disturbed. There may have been more such colonies but only two were located.

Food.

The diet of the Suricate is varied. It consumes both vegetable matter such as corms and rhizomes, and insects. With its strong claws it can dig out the bulbs it requires, and any insects found are devoured at the same time. On many occasions locusts, grass-hoppers, hodotermes, spiders, tarantulas and centipedes have been found amongst the stomach contents of suricates that have been shot.

The breeding period ^{is probably throughout the year} and litters of as many as five young have been found in one nest.

Myonax pulverulentus.

English : Small grey mongoose; Pepper and Salt cat.

Afrikaans : Klein-grys-kommetjiegat; Neuthaar, Garkie.

Xosa ; Ilitse

Sesuto : Mayewane.

The genus Myonax belongs to the sub-family Herpestinae of the family Viverridae.

As a result of its comparative local distribution two varieties only of Myonax pulverulentus are described, one of the North West Cape and one of Little Namaqualand.

Distribution.

The Myonax pulverulentus is practically restricted to South of the Orange River, where it is widely distributed. Fitzsimmons gives it as common throughout the Cape Province and Natal.

Habitat.

Its favourite haunts are the bush-veld and rocky vegetation-covered hillsides. Nests are found in the crevices of rocks and hollow tree stumps, where they live in pairs.

Food

Its diet consists of rats, mice and insects. It will approach fowl-runs and catch young fowls. It is a past-master at killing snakes. Fitzsimmons on one occasion introduced a puff-adder into the cage of a Myonax, a battle ensued with the result that the snake was killed, and starting from the head the Myonax devoured its victim. It is further described that it has a most important mission in the economy of nature, for of all creatures it is the most persistent in its pursuit of rats, mice and noxious insects and should for this reason not be molested.

Genetta felina.

English : Cape Spotted genet; Genet cat (Vryburg).

Afrikaans : Muskejaatkat; Misselkat; Muskkat; Mosaliatkat.

Zulu : Insimba.

Swazi ; Insimba.

Xosa: Inyawagi.

Sesuto : Thsipa.

Sechuana : Tsipa.

The genus Genetta belongs to the sub-family Veverrinae of the family Viverridae.

Roberts lists two varieties of Genetta felina in South and Tropical Africa.

Distribution.

The Genetta felina is the most widely distributed of South African genets, being found from the Cape to the Zambesi and beyond.

Habitat.

Being nocturnal in habits and very secretive the spotted genet is very rarely seen and encountered. Its habitat is therefore not fully determined. It seems from the number of rabid cases reported from Vryburg, that it is very plentiful in Bechuanaland. They seem to favour well sheltered bushy

parts with thick undergrowth. Near Bloemfontein, on the farm Hill-and-Dale they are very plentiful. In one year the dogs killed no less than five. The farm consists mostly of dolomite koppies overgrown with cactus.

Unless they wander a great deal they prefer to be near farm-yards to obtain easy prey in the form of chickens.

Food.

The food of the genet consists of any creature it can overpower, hares, rats, mice, birds with their nestlings and eggs, fowls from farm-yards, etc.

Felis spp.

English : Wild cat; Black-footed cat.

Afrikaans : Wildekat; Groen^ukat; Vaalboskat, Swartpootkat.

Zulu : Impaka, Isobila.

Xosa : Ingada, Inxataza

Sotho : Paka; Mokube.

In the Felis spp. are included the two species Felis ocreata caffra and Microfeles negripes negripes, of the family Felidae. Of the first named species Roberts lists four and of the latter two geographical varieties.

Distribution and Habitat.

The distribution of both species of Felis is very wide. The Felis spp. are found from the Cape to beyond the Zambesi, and frequents hilly country and thick undergrowth where abundant shelter is found during the day.

Food.

Both the species are essentially carnivorous and prey on any animal or bird they can catch. Mice and rats and small birds are very easily caught by these cats. Fowl-houses are frequently visited, from where they will take a fowl and devour it nearby.

Geosciurus capensis.

English : Ground squirrel; Bush-tailed or Fan-tail Meercat.

Afrikaans : Waaierstert meerkat.

Sechuana : Samane.

The ground squirrel (Geosciurus) a rodent, belongs to the family Sciuridae. ^{Three} These varieties have been listed by Roberts.

Distribution.

The distribution of Geosciurus capensis is fairly general. It occurs over the whole of the Karoo, Namaqualand up to Ngamiland, including the Kalahari. It is very widely distributed over the high-veld of the Transvaal and Orange Free State, especially in the western parts of these provinces.

Habitat.

The ground squirrel prefers the plains and is very seldom found in hilly country, but may burrow at the foot of isolated hills. Being dependant on bulbs and tubers it congregates near pans and water courses, digging its warrens on the slopes.

Its strong and well-developed front claws are well adapted to dig extensive warrens in fairly hard soil and shale. In the Kalahari it prefers to burrow in lime outcrops between the sand dunes, as it is probably difficult to keep the burrows open in the loose sand. Where mealie fields exist colonies of the ground squirrel are usually found nearby and even in these fields.

It is generally accepted that this animal does not go far afield for its food but grazes in the vicinity of its burrows. On several occasions squirrels have been caught at their burrows situated more than 800 yards from mealie-fields, with the stomach contents showing that they had fed on mealies.

The ground squirrel is a sociable animal, living in groups up to eight or more in the same colony. Where unsuitable ground exists for digging warrens as in the isolated lime-outcrops in the Kalahari the off-spring remain with their parents, so that the groups increase to twenty or more animals occupying the same colony. The breeding season continues

probably right through the summer. The squirrel is very careful about its nests, which consists of chambers dug out of the tunnels and filled with soft grass and other fluffy material which it can obtain.

Food.

The diet of the ground squirrel which is entirely vegetable, consists mainly of "uintjies" and other rhizomes, corms, tubers, gourds, cactus-leaves, grain and grass seeds, etc. Great damage can be done in mealie-fields when these are near their colonies, especially is this the case in newly planted fields where row upon row of the seed is dug up as soon as it has germinated and the green shoots appear above the ground.

Ictonyx orangiae.

The genus Ictonyx of the family Mustelidae is represented in South Africa by three species, viz. Ictonyx striatus, I. kalaharicus, and I. orangiae with several varieties. Roberts lists five of the first species, three of the second and four of the last named.

The three species are commonly not differentiated and are referred to collectively as "Polecats", or "Skunks".

English : Polecat; Skunk.

Afrikaans ; Stinkmuishond.

Sechuanan: Nakedi.

Sesutu : Thikgoe.

Zulu : Iagaga.

Xosa : Igaga

Distribution.

The striped polecat is found over the whole of Africa, and is the most ubiquitous of all animals, being equally at home in mountains, waterless sand planes, the Karoo, the bushveld and swamps. The other two species of polecats have a comparatively limited distribution. Ictonyx kalaharicus occurs in the Kala har region of Bechuanaland and South West Africa. Ictonyx orangiae extends over the O.F.S., Namaqualand, Transvaal, Zululand and

Ghansin to Damaraland.

Habits.

The polecats are of solitary and nocturnal habits, occasionally hunting in pairs. A group of these were encountered at night in the midlands of Natal. During the day they hide in crevices and burrows, and although terrestrial, can scramble into trees. The characteristic nauseating odour given off when frightened or attacked originates from a fluid secreted by the anal glands. The smell adheres to dogs for days after they have killed a polecat.

Food.

The polecats are more essentially carnivorous than the mongooses, they prey very largely on rodents which they often dig out of their warrens. They kill and devour snakes, lizards, the nestlings of terrestrial birds, and are at the same time fearless poultry raiders.

Owing to their persistent destruction of small rodents, they should be protected, as they render valuable service in keeping the numbers of the gerbilles down which are largely concerned with the dissemination of Bubonic plague.

The Jackal.

Although there is a big difference between the three species of jackals found in South Africa, they are very often confused. The three species are Octocyon megalotus, Cynalopex chama, and Thos mesomelas. Chaeffia adusta which is unknown in the rabies areas occurs in the tropical parts of Zululand, Rhodesia and further north.

Octocyon megalotus.

English : Desert fox; Cape Fennec.

Afrikaans : Draaijakkals, Bakoorkjakkals.

Sechuana : Mathlose, Maclusi.

Distribution.

Two geographical varieties are listed by Roberts. The Octocyon occurs in dry western parts of South Africa, namely

on the Karoo plains, Bechuanaland, North Western Transvaal and South West Africa. In the Kalahari region, where it occurs in great numbers, the natives hunt them for their pelts, for which they obtain two shillings a piece.

Habits.

It is nocturnal in habit, but ventures in daylight in the more secluded parts of the country.

Food.

The animal although listed as vermin and for whose destruction a reward is paid, is really a harmless animal. Its diet consists mostly of termites, beetles, locusts, small rodents, lizards and the eggs and nestlings of terrestrial birds. Farmers in the Karoo maintain that it catches new born lambs. Owing to its destruction of Gerbilles, which play such an important rôle in the dissemination of bubonic plague, it should really receive protection.

The sheep farmers unfortunately in their endeavours to exterminate the destructive Red or Black-backed jackal, have almost completely exterminated this animal, as it is less elusive than the former.

Cynalopex chama.

English : Silver jackal.

Afrikaans : Silwer, Vaal or Draai-jakkals.

Sechuana : Losi.

Sesutu : Mopheme.

Distribution.

The distribution is more or less the same as that of the Cape Fennec, but is nowhere common. Its range is restricted to South Africa south of the Zambesi, occurring on the Cape Flats the Karoo, Orange Free State, Western parts of Transvaal, Bechuanaland, South West Africa, but not beyond the north of Grootfontein and does not occur in the Caprivi Zipfel. It is also absent east of the Drakensberg.

Habit.

Being of a secretive disposition and nocturnal in habit,

it is very seldom seen. During day time it lies hidden in the thick undergrowth, preferably in thick matted thorny bushes. It concentrates round the base of hills and kopjes for shelter. It is less easily caught by dogs than the bakoor.

Food.

Its diet is the same as that of Octocyon, but it is claimed by farmers that it is more destructive to lambs, catching fairly strong ones.

Thos Mesomelas.

English : Common jackal, Black-back, Silver-back or Saddle-back; Red or Cape jackal.

Afrikaans : Rooi- or Swartrugjakkals; Saalrugjakkals.

Sechuana - Sesutu : Phokojoe.

Xosa : Impungutshe.

Zulu : Nkanka.

Distribution.

This is the commonest jackal, and occurs everywhere from the Cape to the Zambesi.

Habit.

This animal although nocturnal in habit will venture in daytime as well. It hides in dense scrub sϕhrub and in hilly country where it can find suitable shelter.

Food.

It is more carnivorous than either the other two species of jackal. It subsists mainly on rodents and wild birds, besides being a scavenger. In spite of it being a scavenger it is very seldom caught in traps or killed with poisonous bait as it is exceedingly cunning and has a very fine scent. It is most destructive to the sheep farmer, catching and killing young sheep. On account of this destructive habit it has cost the sheep farmer thousands of pounds in the loss of sheep and the erection of jackal-proof fencing.

PART II.PREVIOUS ATTEMPTS AT DESTRUCTION OF THE
VECTORS OF RABIES.A. Introduction.

As early as 1930 (Neitz and Marais 1932) it was realised that rabies was firmly established in some of our wild animals, and especially in the Viverridae. In order, therefore, to reduce the incidence of rabies an extermination campaign of meercats on infected and adjoining farms by gassing with cyanide gas was undertaken by the Department. From February, 1930, to June, 1931, forty-three farms in the Transvaal, O.F.S. and the Cape Province were treated.

White (1932) in his report on the above campaign made two statements which dispelled all hopes of success and as a result of which the campaign was abandoned. In the first place he mentioned that reinfestation by meercats of a farm treated, took place even before the gassing operations on that farm were completed. In the second place failure was ascribed to the fact that the gas, especially after abundant rains, was not always effective.

It is also noted that outbreaks of rabies re-occurred on some of the infected farms on which the extermination of meercats had been undertaken, e.g. Cyfergat in the Wolmaransstad district on 20.8.36, in the O.F.S. at Dealesville on 16.6.32 and subsequently at Kromspruit on the 4.11.35 and at Blandfort on 18.9.35.

Thornton (1935) described the want of success in destroying veld rodents in connection with plague control, as due to (1) the use of spent dust or defective

equipment; (2) the preliminary closing up of the entrances, thus preventing effective penetration of all the underground passages by the dust; (3) the treatment of apparently occupied ^{warrens} only, and the neglect of deserted or spare warrens, and (4) the gassing of burrows while the ground is saturated with moisture or while the animals are out feeding.

B. STUDY OF THE STRUCTURE OF MEERCAT BURROWS.

In 1936 when it seemed that the incidence of rabies was increasing and it was realised, that all measures of control would fail unless the disease was checked in the wild carriers, experimental work was planned and carried out with a view to discovering the best means of achieving this.

It was obvious, that an accurate knowledge of the internal structure of the colonies and burrows was required in order to devise the best methods for fumigation, and to determine the causes of failure to kill these animals in the warrens.

A preliminary investigation was started near Wesselsbron, where an outbreak of rabies had occurred. These Preliminary investigations conducted under the direction of Dr. Thomas, consisted chiefly in studying the formation of the colonies and the structure of the burrows of the Cynictis, Geosciurus, and Suricata.

A considerable number of colonies, both small and large were dug up, during the course of these and subsequent experiments, and they were described and sketched to scale.

Procedure followed in the Study of Burrows.

The procedure adopted was shortly as follows:
Two wires were stretched at right angles across the colony,

and staked. These wires then represented the coordinates. Corresponding coordinates were drawn on graph paper. The most convenient scale was found to be five feet to the inch.

The situation of the openings of the warrens were measured from the coordinates with a tape measure and were marked as small circles on the sketch. Digging operations were then started, commencing from one or more openings, and the warrens were carefully followed. As the digging progressed the depth and directions of the warrens were measured in the same way from the coordinates and traced on the graph paper as accurately as possible.

Description of the Burrows.

The three above mentioned species of burrowing animals dig their burrows very much on the same intricate pattern, which is more easily illustrated than described.

Sketches I, II and III represent very simple colonies. The first dug and inhabited by Geosciurus, the second by Suricata, while the third was inhabited by Cynictis. Sketch IV is typical of colonies of the more complicated nature.

The colony usually consists of a number of holes dug at an angle of about 30 to 40 degrees to the surface for a depth of two to three feet, according to the nature of the soil.

In cross-section the hole is roughly half-moon shaped approximately 3" high and 4" wide.

At more or less the same level underground, the tunnels are interconnected to form a maze or network. At intervals chambers are formed, lined with soft grass, forming the breeding and sleeping places. It has been found very frequently, when colonies were dug up, inhabited both

by the squirrel and the yellow mongoose, that the part inhabited by the former the bedding in the chambers consisted of fresh straw, while the chambers occupied by the latter, the bedding was old and in a decayed state or no bedding at all was present. It is evident, therefore, that the squirrel carefully prepares its breeding chamber, while the yellow mongoose is satisfied with what it can obtain in sections vacated by the squirrel.

A very remarkable feature is that the tunnels are more or less on the same underground level, only occasionally does one find a tunnel passing under another, and thus failing to connect up or only connecting up when it has been down for a considerable distance, when it passes upwards again. The tunnels which do not connect usually end up in a chamber. A feature, which was found to have an important bearing on the gassing (to be described later) of the colonies, was the presence of unconnected tunnels ending in cul-de-sacs, usually situated at the periphery of the colony and extending up to 30 feet or more. Such a tunnel is well illustrated in sketch III extending towards the top. In a colony (sketch V) that has been exploded by dynamite and afterwards dug up, a tunnel thirty feet long was revealed at the end of which a female suricate with a litter of five was detected.

There seems to be no limit to the size of the colonies. New holes and tunnels are added from time to time as the older portions are abandoned, or as the squirrel has to make room in its quarters for the yellow mongoose. Colonies containing as many as a hundred or more openings, measuring fifty yards in diameter are frequently found. In such cases only a few of the openings on the periphery show signs of being in use.

Fresh excavations on new colonies or extensions