tentotus komatiensis (Roberts) — common mole-rat, *Cryptomys hottentotus stellatus* (Roberts) — Lowveld mole-rat, and *Cryptomys hottentotus streeteri* (Roberts) — Natal mole-rat.

Molehills have been found: in the Letaba Rest Camp, between the Sabie and Sand Rivers, along the old Faai tourist road, eastern boundary road at Pumbe, vicinity of Satara, Nwanetzi patrol road at Shibotwane, between Dzombo and Shingwedzi, between Shingwedzi and Nkulumbene and between Stangene and Nkulumbene, on the way to Dongadziba, the Malonga fire-break road, in the Nyandu bush, between Wambia and Nwashitsumbe, along the western boundary between Dothole and Boshahuku, between Mapongole and Dobotzi, Dobotzi and Pukwane and Pukwane and Mapongole, on the road to Bububе dam, along the Ngwendu road between Bububе and Pukwane, on the way to Dzombo east windmill, near Nkulumbene fire-break road, along the eastern boundary road, on Shingomene fire-break road, at the Shawu experimental plots on the Nkulumbene fire-break, near Palangala spruit on the eastern boundary fire-break. on the Mlondozi fire-break road, the fire-break round the Satara experimental plots, on the Trichardt road, Nwanetzi and Lindanda experimental plots, on the fire-breaks round the Faai experimental plots, along the Lower Tendi River road, on the Nkodozi fire-break road, as far west as the windmill, on the Bububе fire-break east of the Pondo hills, along the North Eastern boundary of Batavia, where the road branches off from the western boundary to the Shiyanamane dam site, on the Ngotsa fire-break road, the track to the Olifants River waterfalls and at Gorge camp, along the Mavumbye fire-break road, the Pelwane fire-break to the north of Manzentonto dam, at the gate between Mashiki and Kowa-kulu, the Machindudzi-Machai fire-break road and the Letaba River circular drive.

Family 2 — *Hystricidae.*

1. *Hystrix africae-australis* (Peters) — Porcupine.

Is widely and generally distributed throughout the Park, yet seldom seen during the day. They are frequently hunted by decrepit beasts of prey, yet they are formidable opponents and inflict painful wounds which frequently cause fatal abscesses. A few new localities recorded during the year, include — the Nkokodzi fire-break road at the windmill, the fire-break road from Dagen to the Olifants River, Matikiti Koppie between Nwanetzi west and east windmills, and the caves in the Skukuza hills.

Family 3 — *Octodontidae.*

Sub-Family — *Thryonomyinae.*

1. *Trhyonomys swinderianus* (Temminck) — Cane rat.

Sometimes very plentiful locally, near permanent water, throughout the

Park. A new locality recorded is the Shitsakana Spruit at Satara. It was noted that cane rats gnawed the stalks of *Sorghum versicolor* and *Cassia mimosoides* at the Tendi and Dzombo experimental plots, during the rainy season.

Family 4 — *Sciuridae*.

1. *Paraxerus cepapi cepapi* (A. Smith) — Yellow-footed squirrel.

These animals are present in great numbers throughout the Park, although many are burnt to death in uncontrolled veld fires. Genets (*Genetta* spp.) must apparently be numbered among their natural enemies, taking into account the stubborn efforts of one of these wily predators to catch the squirrels homing in the roof of the Satara residence. The red squirrel (*Paraxerus palliatus auriventris*. Roberts) has not yet been found in the Park, but possible localities are the Nyandu sandveld and the Msimbit bush on the eastern boundary.

Family 5 — *Pedetidae*.

1. *Pedetes capensis salinae* (Wroughton) — Spring Hare.

Do not occur in the Southern district, yet present in the central district in the Pumbe sandveld and more commonly distributed in the northern district — among other localities, along the Shingwedzi River, the Punda Maria area, the Malonga sandveld and Dobotzi.

New localities recorded this year, include — the Wambia area, at the foot of Gumbandevu, the Magobane-Mahembane sandveld, the road to Mahlangene, and along the main road between Letaba and Tendi Rivers.

A single specimen was collected near Punda Maria gate.

Family 6 — *Muscardinidae*.

Sub-Family — *Graphiurinae*.

1. *Graphiurus (Claviglis) murinus streeteri* (Roberts) — Forest dormouse.

These attractive little animals have a wide distribution in the Park and have been recorded at Pretoriuskop, Numbi Gate, Skukuza, Kumane Dam, Shangoni, Punda Maria, Nwanetzi Camp, Shingwedzi quarters, Pelwane-Manzentonto fire-break near Sweni drift, Letaba Rest Camp and Pafuri. Two specimens were collected at Tshokwane and on the Mareyo experimental plots.

Eastwood's dormouse (*Graphiurus platyops eastwoodae*. (Roberts) has not yet been observed.

Family 7 — *Muridae*.

Sub-Family — *Murinae*.

1. *Saccostomus campestris campestris* (Peters) — Pouched Mouse.

Specimens of these mice have been collected between Malelane and

Crocodile Bridge, Hape pan (Pafuri), Punda Maria and 2 miles to the east of Skukuza.

2. *Lemniscomys griselda sabiensis* (Roberts) — Single-striped field mouse.

A field mouse species which is reasonably plentiful locally and is also seen frequently during the day. Has either been observed or collected at Sangoni, Punda Maria, the Shawu experimental plots, Skukuza, 16 miles from Shingwedzi on the way to Punda Maria, the south-western Shingwedzi River road, Shingwedzi, Shingwedzi-Dzombo confluence, Tendi River road, Nwanetzi, Gorge Camp and Satara.

3. *Mus minutoides umbratus* (Thomas) — Dwarf mouse.

Collected at Skukuza, Toulon, and 10 miles from Punda Maria on the way to Pafuri.

4. *Mus musculus* (Linnaeus) — House mouse.

A cosmopolitan species. so far collected only from the Shangoni compound.

5. *Dasymys incomtus* (Sundevall) — African marsh or water rat.

Observed during veld-burning at the Numbi test plots, but has not yet been collected.

6. *Rattus (Aethomys) chrysophilus tzaneenensis* (Jameson) — Red veld rat.

Distributed throughout the Park, yet are not particularly numerous in any locality. Localities: Rabelais gate, Hape pan (Pafuri), Punda Maria Rest Camp, 16 miles from Shingwedzi on the way to Punda Maria, end of South-western Shingwedzi River Road, 13 miles south-east of Shingwedzi, Tendi River Drive, Malopene Spruit, Nwanetzi Drift (Letaba), Letaba Rest Camp, Satara Rest Camp, Nwanetzi, Tshokwane, Skukuza, Lower Sabie Rest Camp, Skukuza hills, Malelane Rest Camp and Crocodile Bridge.

7. *Rattus (Thallomys) paedulcus acaciae* (Roberts) — Black-tailed tree rat.

Found northwards from Letaba only and collected at Letaba camp, Shingwedzi (wood-pile) and Hape Pool (Pafuri).

8. *Rattus (Mastomys) natalensis microdon* (Peters) — Multimammate mouse.

Exceptionally numerous, generally distributed and apparently not limited to any specific habitat. Localities: Skukuza Camp, Hape Pan (Pafuri), Shangoni, Shingwedzi, Tendi River, 34 miles north of Letaba, Malopene, Nwanetzi, Letaba, Rabelais, Olifants River, Satara, Toulon Gate, 2 miles east of Skukuza, Sabie Picket, Tshokwane, Lower Sabie, Malelane, Crocodile Bridge and Nkuane Pan.

9. *Rattus (Praomys) namaquensis drakensbergi* (Roberts) — Namaqua rock rat.

A species found generally in suitable surroundings (rocky places) in the Park. Localities: near Hape pool (Pafuri), "Skatkoppie" near Mlambane dam,

southwest of Shingwedzi (Gubyane), Letaba, Olifants River, 8 miles from Rabelais to Satara, Nwanetzi, 5.9 miles from Nwanetzi to Skukuza, Skukuza, Skukuza hills, Nwashitsaka drift and Malelane.

10. *Rattus rattus frugivorous* (Rafinesque) — Black rat.

This introduced rodent has so far been observed only in the Skukuza compound where it appears in large numbers and, if possible, should be exterminated.

11. *Cricetomys gambianus haagneri* (Roberts) — Haagner's giant rat.

Native Rangers of the Punda Maria Section maintain that they have already encountered these animals in the ranges behind Punda Maria between Mahembane and Malituve but this locality has yet to be checked.

Other species, which by more intensive surveys, may also be found are the striped field mouse (*Rhabdomys pumilio dilectus*. De Winton) and the spiny mouse (*Acomys caharinus transvaalensis*. Roberts).

Sub-Family 2 — *Dendromurinae*.

1. *Steatomys pratensis pratensis* (Peters) — Fat mouse.

A single specimen was collected at Bububе dam, but it is maintained that these mice are plentiful in the Dothole-Malitenga region.

2. *Dendromus (Poemus) melanotis vulturnus* (Thomas) — Black-eared grass-climbing mouse.

Last year in October, grass nests in low shrubs were found on the experimental plots at Skukuza and Shaben, which had almost certainly been built by this species. The animals themselves, however, have not yet been collected.

A related form, *Dendromus mesomelas mesomelas* (Brants) — the Red climbing mouse — may also still be found in the South.

Sub-Family 3 — *Otominae*.

Signs of a marsh rat species, which may prove to be *Otomys irroratus sabiensis* (Roberts)· have been observed repeatedly, but the animals have not yet been collected.

Sub-Family 4 — *Gerbillinae*.

1. *Tatera schinzi limpopoensis* (Roberts) — Schinz's gerbil.

Distributed throughout the Park in fairly large colonies in suitable sandy surroundings. Seldom, if ever, seen during the day, but very active at night. Localities: Punda Maria, Masandje windmill, 16 miles from Shingwedzi to Punda Maria, Shangoni, Tendi River road, Malopene, Nwanetzi (Letaba Section), Letaba camp, Shitsalaleni, Toulon Gate, 6 miles northwest of Skukuza, 2 miles east of Skukuza, Sabie River Banks (Skukuza), Sabie Picket, Skukuza hills, Tshokwane, Crocodile Bridge.

There is a slight possibility that the lesser gerbil *(Gerbillus gerbillus coombsi.* Roberts) may also invade the northern sandveld beyond Punda Maria. Surveys must still be carried out here.

SUPER-ORDER — FERAE.

ORDER 7 — CARNIVORA.

SUB-ORDER — FISSIPEDIA.

Super-Family 1 — *Canoidea.*

Family 1 —*Canidae.*

Sub-Family — *Caninae.*

1. *Canis (Thos) mesomelas mesomelas* (Schreber) — Black-backed jackal.

This year these animals were encountered more frequently in the northern sections and although five were seen together near Skukuza on one day, they are not numerous in any part, not even in the southern and central districts. A slight increase is reported from the Pretoriuskop area. A dock-tailed specimen was observed near the Ngirivane windmill and new localities recorded during the year, are: Pafuri, the Tendi experimental plots, and along the Shipikane fire-break road. The carcasses of nine impala lambs, caught by black-backed jackals were found.

2. *Canis (Thos) adustus adustus* (Sundevall) — Side-striped jackal.

Occurs in all three districts of the Park, but is seen more frequently in the northern regions, although even there it is rather rare. This year distribution data was obtained from throughout the Park and, this probably indicates a slight increase in population. The largest number found together was three (at Malopene Gate). Elsewhere they were encountered singly or in pairs e.g. at Gomondwane, Nwanetzi Drift, Bango, Satara, Batavia, Klopperfontein, Malelane, Mhulu, Kowa-kulu windmill, near Nahpe, the Nwashitsumbe fire-break road and near Shipikane mouth.

3. *Lycaon pictus pictus* (Temminck) — African wild dog.

Distributed in smaller or larger packs throughout the entire area but mainly in the Malelane area and in the central district. This year, for the first time for some while, reports were received regularly from north of the Letaba River of the appearance of small packs, varying from a few animals to 25 — among other localities, in the Malopanyane area, along the Shingwedzi, near the Mbyashishe picket (especially from January to March), in the ranges beyond Punda Maria (Magobane), at Pafuri (1), and Shalungwa spring. Between the Letaba and Olifants Rivers small packs were seen frequently along

the western boundary at Malopene, Tuti and Shumangu during September and again from March this year.

Wild dogs were encountered at intervals in small groups or larger packs along the old familiar hunting routes in the central district and the largest pack seen at Mutlumubi in October, numbered 35 animals. A pack of 15-17 animals was seen frequently in the neighbourhood of Lion Pan, the "Tablet-koppie" and Manzimahle. Smaller packs appeared sporadically at Nyamene, Gudzane, Msitsawe, Shishangane, Mlondozi and along the western boundary (Tswiriri). On 31/8/58 a pack of 16 adults with 8 young pups was found in the Tshokwane section. When the Ranger approached to investigate, a few dogs (males) formed a rearguard, barking aggressively and advancing a few yards, only to come to a halt again, until the pups (which were still very young) had reached a safe distance.

As usual in the South, large packs were always active in the Malelane mountains — e.g. on one occasion 41 were seen at Mtjulu and a pack of 31 at Tlalabye. Smaller packs were reported regularly from the Sabie corner area of the Pretoriuskop section as well as, less frequently, from Pretoriuskop vicinity, at Stungwane, Lokahle, Sithlabe and along the Nahpe and Doispan roads. For some while a group of four lingered in the neighbourhood of Skukuza. Last year, during March, it was seen that a large leopard caught an impala on the Doispan road near Skukuza. As soon as the buck had been felled, these four wild dogs appeared on the scene, ousted the leopard and started fighting for the carcass. The leopard moved off, but suddenly roared, and charging, scattered the wild dogs, gathered up the impala and leapt with it into a tree. There it settled down peacefully to its repast while the dogs, whining frantically and greedily, tried to reach it.

Carcass-data of kills by wild dogs during the year, indicate the loss of the following animals: 75 impala, 1 blue wildebeest, 6 kudu, 1 warthog, 1 reedbuck, 2 duiker, 1 steenbuck and 2 bushbuck.

Family 2 — *Mustelidae.*

Sub-Family 1 — *Mustelinae.*

1. *Ictonyx striatus maximus* (Roberts) — Polecat.

The status of this animal in the Park is still somewhat uncertain and the following localities must be varified: Dongadziba, Shingomene, Rockvale, Malelane, Lokahle mouth, Gaisenga, Letaba and Mangwa-induna.

2. *Poecilogale albinucha transvaalensis* (Roberts) — Snake mongoose.

The presence of this rare species is still extremely doubtful. It is alleged that a few specimens have been observed in the vicinity of Shingwedzi, Letaba and Sabie Poort, but this has not yet been verified.

Sub-Family 2 — *Mellivorinae.*

1. *Mellivora capensis capensis* (Shreber) — Honey badger.

Comical but intrepid animals prevalent throughout the entire Park, and which cannot be considered as very rare. During the year a number has been observed at: Stangene, Dzombo windmill, Nwanetzi experimental plots, Lokahle, Timfenene, Mlambane drift and 7 miles from Pretoriuskop on the Nahpe road. The carcass of an impala lamb, presumably killed by a badger, was found at Rabelais Dam.

Sub-Family 3 — *Lutrinae.*

1. *Lutra maculicollis maculicollis* (Lichtenstein) — Spotted-necked otter.

It has not yet been established without doubt whether these aquatic animals are to be found in the Park. It is alleged that specimens have been seen in the Crocodile and Sabie Rivers and elsewhere in the Park but the possibility of confusion with the clawless otter (see below) is extremely likely.

2. *Aonyx capensis capensis* (Schinz) — Clawless otter.

Sufficient proof of the presence of this animal in the Park exists and during the year further evidence of its distribution has been obtained indicating that it is also found at Mahlangene, Lokahle Mouth, the confluence of the Crocodile and Komati Rivers, Bangu Poort and Nhlarulume Drift.

Super-Family 2 — *Feloidea.*

Family 1 — *Viverridae.*

Sub-Family 1 — *Viverrinae.*

1. *Viverra (Civettictis) civetta civetta* (Schreber) — Civet.

Plentiful and distributed throughout the Park and is observed chiefly at night, but sometimes also on overcast days. The faeces of a civet has been found high up on the Skukuza hills under projecting rocks. An analysis of this showed evidence of indigenous fruits (pips of *Diospyros mespiliformis* — Transvaal ebony), verdant grass, insects viz. beetles, dung beetles, locusts, etc., the legs and scales of a large lizard, the fur of mice and rats, and pieces of bone of birds or small mammals. The stomach of a rat was apparently removed and not devoured. It also seems as if the dung balls buried underground by dung beetles, are dug up and broken open to obtain the few large larvae.

2. *Genetta genetta pulchra* (Matshie) — Small-spotted genet.

Prevalent and reasonably plentiful especially in the southern areas. Observed chiefly at night as they shelter during the day in palm thickets or hollow tree trunks. It has been observed that they also prey on yellow-footed squirrels (at Satara) and frogs (during February at Nwashitsaka Drift).

3. *Genetta rubiginosa letabae* (Thomas & Schwann) — Rusty-spotted genet.
More prevalent in the northern areas though not at all unusual at night along the roads of the southern and central districts.

It is extremely doubtful whether the large-spotted genet (*Genetta tigrina*. Schreber) is to be found in the Park in spite of assertions by certain native game rangers.

Sub-Family 2 — *Herpestinae*.

1. *Herpestes ichneumon sabiensis* (Roberts) — Sabie ichneumon.
This species was collected many years ago in the vicinity of Satara, but the animal is very rare, and in living memory has been found only near the Sabie River. No new localities have been reported during the year.

2. *Herpestes (Galerella) sanguineus cauui* (A. Smith) — Slender mongoose.
Reasonably plentiful and the most widely distributed of all the mongooses in the Park. The animals are usually encountered singly and have been seen at Satara, 2 miles north of Mazite, beiween Nwanetzi and Sweni, and at Dzombo windmill.

3. *Helogale parvula parvula* (Sundevall) — Dwarf mongoose.
Distributed in suitable localities throughout the Park, though not in large numbers anywhere. Observed more often in the western areas and so far not in the Lebombo. Reasonably large colonies are sometimes found and often old termite nests serve as shelter. The animals have also been found on the farm Zwartkops recently incorporated in the Park.

4. *Mungos mungo senescens* (Thomas & Wroughton) — Banded mongoose.
A gregarious species found in smaller or larger (up to 75) colonies throughout the Park. Those in the far north show distinct colour deviations and probably represent a sub-species. This year it has again been observed that these animals hunt insects and arthropoda sheltered by stones and old tree stumps in the company of baboons. Localities recorded include Manzi-mahle windmill, Sweni Drift (main road), in the Msimbit Bush at Olifantspoort, immediately south of Nwanetzi Drift (Letaba Section), immediately north of Mbyamide Drift, along the Timbavati River, Mutlumubi, Orpen Dam, W.N.L.A. Dam, Pafuri and near Mpombo picket.

5. *Atilax paludinosus paludinosus* (G. Cuvier) — Water mongoose.
Rare and seldom seen on account of their exceptionally timid nature. Said to have been found at Pafuri, Magamba, Muwawi waterhole (Shisha), and the Sabie River near Skukuza. (Possibly also at Mahlangene.) Poachers snared one along the Sabie, near Paben (approximately $\frac{1}{4}$ mile north of the river on the farm Calcutta). Unfortunately the skin was not preserved.

6. *Rhynchogale melleri langi* (Roberts) — Meller's mongoose.

Occurs in Swaziland and the adjoining North Eastern Transvaal regions. Reported on one occasion only in the Park and then at the foot of Shaben Kop near Pretoriuskop. This report has not yet been confirmed and the animal must be regarded either as exceptionally rare or else not present in the Park.

7. *Ichneumia albicauda grandis* (Thomas) — Giant white-tailed mongoose.

Less rare than is generally supposed and distribution data indicates a fairly general distribution throughout the Park. During the year the ainmals were seen on two occasions at the foot of Nwamuriwa.

The Selous or lesser white-tailed mongoose (*Paracynictus selousi selousi*. de Winton) has not yet been encountered in the Park, but this year, during February, a dead specimen was picked up on the road between Hoedspruit and Klaserie. (A new locality for Transvaal). Thus it is possible that the animal may invade the far western regions along the Olifants River.

Family 2 — *Protelidae*.

1. *Proteles cristatus transvaalensis* (Roberts) — Maanhaar jackal (Aard wolf).

These animals are very rare in the Park and until recently were known only from Pretoriuskop-Sithlabe-Numbi area, but last year in September, the Ranger of Tshokwane Section saw one approximately a mile to the north east of the old Saliji borehole. A few years ago, the Ranger of Crocodile Bridge also encountered one at Spalên on the Nhlowe road. Reports that these animals had been seen in the past, near Orpen (old Rabelais Camp) and between Letaba and Olifants Bridge, have not yet been confirmed. One was seen again this year in the familiar habitat, viz. on the Nahpe road about 5 miles east of Pretoriuskop.

Family 3 — *Hyaenidae*.

1. *Crocuta crocuta* (Erxeleben) — Spotted hyaena.

For the past number of years spotted hyaena have been a rare sight in the Punda Maria Section, but during this year there have been encouraging signs of population increase and several were seen in the vicinity of Punda Maria, Klopperfontein, Malonga, Nwashitsumbe and Pafuri, as well as along the western boundary (where unfortunately they are attracted by the livestock on the Trust territory and consequently snared). Elsewhere in the northern regions the animals occur in satisfactory numbers and in parts of the southern and central districts, they are decidedly numerous. A group of 21 was found one night at Manzendlovu drift at the carcass of a wildebeest. Fairly large numbers have also been reported in the Klokwene, Mlambane and Mbyamide areas in the south. Several cases have been reported of these animals hunting their own prey, but the victims have usually been impala. The stomach con-

tents of hyaena, killed in the Pretoriuskop area, frequently consisted of portions of tortoises, as well as portions of other types of prey, besides impala hair, bones, hooves and skin.

Quite a number of instances were reported from the Pretoriuskop section of a pair or group of spotted hyaena ousting leopards or wild dogs from their kills and devouring the carcases themselves.

Last year, during April, three hyaena were born in the cavity of a large anthill along the Nahpe road. When the young animals ventured outside their shelter for the first time, they were quickly spotted by tourists, lured to the road with different kinds of food and fed. Within a very short while all three of them were complete beggars and after they had been weaned, they did not make the slightest effort to procure food for themselves. During the tourist season they remained in the vicinity of their old shelter and received sufficient food from the tourists. Once the main tourist season was over the animals suffered great hardship and eventually, due to starvation, their number was reduced to one. This animal succeeded in surviving the summer and can still be seen occasionally in the vicinity of the old anthill — a pitiful example of what the thoughtless actions of tourists can cause.

Mr. B. de la Bat, Chief Game Conservator of South West Africa, informed us that a spotted hyaena, shot in the Etosha Pan, weighed 168 lbs.

2. *Hyaena brunnea* (Thunberg) — Brown hyaena.

A rare animal of which the distribution is limited more to the northern regions — especially the Shingwedzi River strip, Klein Letaba-Mbyashishe area and Punda Maria section. A few localities are also known from the central and southern districts. During August a group of brown hyaena felled a kudu bull near Punda Maria. One evening, at dusk, in September, another group attacked the donkeys at Shangoni and killed two.

Last December two were seen in the vicinity of the Gaisenga waterhole along the Bume spruit, and according to an unconfirmed report, a single specimen was also observed recently at the drinking hole near the Skukuza Hills. The carcass of a wildebeest, which was probably killed by these animals, was found at Klein Letaba.

Carcasses of animals killed by hyaena (mainly spotted hyaena) and found by patrols, include the following:

5 impala, 2 waterbuck (calves), 1 wildebeest, 5 kudu, 1 reedbuck and a bushbuck.

Family 4 — *Felidae.*

1. *Felis lybica cafra* (Desmarest) — Cape wild cat, or Kaffir cat.

According to available distribution data this is probably the most plentiful and widely distributed wild cat species in the Park. A number of new

localities has been noted during the year, viz. immediately north of Makonkolwine Drift, Nwanetzi Drift (Letaba Section), approximately 3 miles north of Olifants Bridge, approximately 3 miles northwest of Letaba Rest Camp, Pumbe, on the road to Mahlangene and between Gudzane and Mavumbye.

2. *Felis (Microfelis) nigripes* (Burchell) — Black-footed cat.

The distribution and presence of this animal in the Park is extremely doubtful. It is believed that it is to be found in the palm thickets of the Nkulumbene-Shingomene-Babalala area, but no confirmation has yet been obtained.

3. *Felis (Leptailurus) serval hamiltoni* (Roberts) — Serval cat.

This species was originally collected along the Timbavati River in the Satara section. It is fairly widely distributed and probably more plentiful in the northern sections, but not as abundant as the Cape wild cat. New localities are: Folly Dam (Pretoriuskop), near Punda Maria-Pafuri crossroads, Mtomenemabili Pan, Tsange fire-break road — eastern extremity, immediately south of Babalala, Tropic of Capricorn fire-break road, Skukuza Experimental Plots, Bangu Poort, between Tshokwane and Lion Pan and 2 miles east of Malopene Rest Camp.

4. *Felis (Caracal) caracal caracal* (Schreber) — Caracal.

The distribution is limited to specific areas although the animal is prevalent throughout the Park and is perhaps more plentiful in the area north of the Olifants River than in the southern and central districts. Only a few specimens have been observed this year at Boyela, Nkokodzi, Machindudzi, Gumbandevu, Dzundwene, 4 miles north of the Sand River on the western boundary road, along the Lower Sabie Road near Skukuza, between Shangoni and Bubube and on the road from Punda Maria to Mahembane.

5. *Acinonyx jubatus jubatus* (Schreber) — Cheetah.

According to available indications (regular records of cheetah observed received monthly from all sections) the numbers of these animals are alarmingly small, and the number of young animals and cubs discouraging. Their distribution is scanty and covers the entire Park. The largest number of cubs was reported during the period March-April though young cubs were encountered as early as November. The largest family group consisted of 7 (3 adults and 4 young ones) observed at Mbyashishe Drift. For the rest, lone animals or groups of 2 to 4 were encountered.

An analysis of available records indicates the following distribution and numbers:

1. *Southern District*

Section 1 (Pretoriuskop). Localities: Paben, Nahpe, Mtamehlo, Pretorius-

kop, Nwatiwambo, Samarola, Komapite, Sithlabe, Paben branch road, Jock branch road, Mtsawu, Mestel, Shaben.
Total: 22-25 (11 young animals).

Section 2 (Malelane). Localities: Hlambanyati, Lokahle upper reaches, Mlambane Dam, 12 miles from Malelane on the main road, Josekulu, Matjuluane, Nsikazi Road, Nhlowa, Timvenene, Thalabye, Boulders.
Total: 22 (8 young animals).

Section 3 (Crocodile Bridge). Localities: East of Orami, east of Makambi, Lower Sabie road, Mhlanganzwane, Gomondwane.
Total: 11 (4 young animals).

2. *Central District*

Section 4 (Tshokwane). Localities: Mlondozi dam road, 1 mile north of the Trichardt road, Sabie River, Ngwenyeni dam, Mchlowa, Hlanguleni, Tswiriri, near Orpen Dam, Zubutwane, Old Squatters Camp, Lipape.
Total: 16 (no young animals).

Section 5 (Satara). Localities: Mavumbye fire-break, Shitsalaleni, Bango, Aerodrome, Shikelenkane, Sweni Drift.
Total: 9 (1 young animal).

Section 11 (Kingfisherspruit). Localities: Orpen-Satara road, Naboom Kop, Klaserie, Tseri.
Total: 7 (3 young animals).

3. *Northern District*

Section 6 (Letaba). Localities: Malopene road, Tuti area, Letaba circular drive, Tendi experimental plots, Malopanyana, Makadze, Dagen fire-break road, 2 miles south of Letaba.
Total: 13 (no young animals).

Section 7 (Shingwedzi). Localities: Nwambu fire-break road, Shingwedzi River.
Total: 8 (5 young animals).

Section 8 (Punda Maria). Localities: Between Shingwedzi and Punda Maria, Magamba road. (Former localities — Klopperfontein, Punda Maria, Pafuri, Nwashitsumbe).
Total: 10-12 (no young animals).

Section 9 (Shangoni). Localities: Pans between Pukwane and Bubube, Shangoni Drift, Msisi Kop.
Total: 6 (no young animals).

Section 10 (Mahlangene). Localities: Mbyashishe Drift.
Total: 7 (4 young animals).

Therefore, the total is 58 (23 young animals) for the region south of the Sabie River, 32 (4 young animals) for the central district and 46 (9 young animals) for the northern district.

No cheetah were destroyed this year during control measures and according to the new policy, which was recently put into operation, this rare predator type, has been withdrawn completely from the control programme, barring exceptional instances. (Refer to section Predator Control).

Carcasses of animals, killed by cheetah, have decreased considerably, when compared with the figures of previous years and the following have been reported: 47 Impala, 2 waterbuck, 1 wildebeest calf, 6 kudu calves, 3 warthog, 1 roan antelope calf and 5 reedbuck.

The sensation in the press last year about a king cheetah (*Accinonyx rex*. Pocock), which was said to have been seen regularly at Olifants Camp by a tourist came to nothing, and a search undertaken by the person concerned and the biologist, yielded nothing more interesting than a civet.

The king cheetah became known to science as recently as 1926 and was identified by Pocock as a new species. Since then the majority of taxonomists have agreed that these animals are local colour variants of the common cheetah and do not justify specific status. The animals differ from the common cheetah by their peculiar black-brown stripes and definite blotches instead of the usual spots. A fully mounted specimen of the king cheetah, from Bikita (Southern Rhodesia), is to be seen at the South African Museum in Cape Town. The skin and skeleton were presented by Mrs. E. W. McL. Thomas in 1928.

6. *Panthera pardus pardus* (Linnaeus) — Leopard.

Although no regular monthly records of leopard numbers have been received from the various sections until recently, the distribution data at present at our disposal, indicate a population-strength of quite double the number of the cheetah in the Park and there are possibly more than 350. A large percentage of this total covers the northern regions, but leopard are reasonably plentiful in parts of the central and southern districts — e.g. along the larger rivers and streams, the Lebombo range and lone ranges and hills.

Cubs were seen during May (2) and June (3), but young animals (from 2 to 3) have also been observed during March and December.

Carcass data shows that besides the large numbers of Impala, cauaht annually, leopards are also the chief natural enemies of species such as reedbuck, duiker, nyala, bushbuck and klipspringer. The following carcasses were found:

Impala	342	Eland calves	1	Baboon	6
Waterbuck (young)	21	Reedbuck	7	Porcupine	1
Zebra foals	5	Duiker	4	Bushbuck	4
Wildebeest calves	1	Ostrich	1	Grysbok	1
Kudu	13	Steenbuck	1	Nyala	2
Warthog	7	Klipspringer	2	Hares	1

Besides the above-mentioned prey species, large numbers of cane rats, hares, ground birds, as well as other smaller mammals are caught by young or old leopards. (Sometimes also by leopards in their prime). For example, a leopard was observed catching two guinea-fowl along the Lower Sabie road. At Letaba, one killed a hare very near to the Ranger's garden gate.

During the year three leopards were destroyed as a protective measure for life and property and one was killed in a fight near Malelane.

7. *Panthera (Leo) leo krugeri* (Roberts) — Lion.

The rising curve of population increase of the majority of the species in the Park during the past few good years, is naturally reflected in a parallel, gradual growth in the lion population, in spite of control measures in local areas, which at times were necessitated by circumstances.

From the beginning of the year, lions have been found distributed in larger or smaller prides throughout the entire Park, with a focal point of population density in the central region; the southern regions still harbour considerable numbers while in the regions north of the Olifants River, which show the lowest community density per surface unit, there are many signs of an upward trend, to be seen. The only exception here, was the fairly isolated Pafuri area, from which lions disappeared in 1950 and which they avoided altogether for 8 years — a development, which must definitely be regarded as unfortunate, and in our opinion, one of the main contributing factors to the phenomenal growth of the herbivorous community and the consequent and unavoidable severe over-stocking, bush encroachment and disease occurrences, which generally accompany such overpopulated conditions. These disrupted conditions have become deeply rooted and particularly during the winter months the overall picture was alarming.

It is thus with great satisfaction that, while on tour with Prof. Hörstadius of Sweden, we could report on 1st May, last year, the presence of the first lions at Pafuri, after the lapse of so many years. On that occasion, a fully-grown maned lion and younger male and female were observed to the east of Hape Kop. However, soon afterwards a report was received that 8 lion had moved into this area.

A more favourable development could not have been wished for, but unfortunately a few have since wandered over the boundaries and been snared in Portuguese territory and Makulek's location. However, those remaining, must have been joined by others, as at present after a year, the lion community numbers from 8-10 animals.

We believe that the presence of these beasts of prey at Pafuri will contribute a great deal to the rehabilitation of the area as a whole and to the promotion of a sounder balance between the predators and their prey in the community there.

In November, last year, a large black-maned lion took up its abode in the hut on Hape Kop for a considerable time and gave two native rangers, who approached the hut unsuspectingly, the fright of their lives as on opening the door they were confronted by the wild face of the old patriarch. To their relief the lion only growled threateningly and left the building by jumping through the open window. Apparently the animal had been injured (judging by the blood splotches in the room) and had sought the coolness and solitude of the hut as protection against the burning summer sun. Strangely enough the lion returned repeatedly to the hut until it was seen there for the last time on 13th November.

During July native rangers at the Bume picket were visited by a number of lion. A reed mat, lying outside, was picked up by the animals and torn to ribbons. A basin and tin mug were carried some distance into the veld and badly bitten. One large black-maned lion dragged a burning log from the smouldering fire and carried it away. Fortunately the grass was sparse where the log was laid down and only a small patch was burnt, otherwise the old rascal could have been charged with arson!

During October, a pride of lions reappeared after a considerable time in the immediate vicinity of Pretoriuskop. Apparently they found the area to their liking and very soon the first wildebeest carcass was reported. However, on account of the control measures, the Ranger was obliged to put an end to this, as well as to a later attempt of re-colonising this former lion habitat. The indications are that, as soon as there are sufficient numbers of game in this area again, it will not take them long to move in, as there are frequent reports of raids.

This year during March, a pride of 12 lions, among which there were two albino cubs, was seen by tourists below Nwamuriwa. A rare sight, but the animals have not been observed since then.

The largest pride of lions were again reported from the Tshokwane section — one, numbered 25 animals and trailed the dense wildebeest concentration along the western boundary during the autumn months.

Lions were active everywhere during the dry season, but with the first summer rains and the consequent scattering of the herds of game, a period of ceaseless hunting and hardship, particularly for the younger animals, commenced. Quite a number of young lions, which left the parental care during this period, died of starvation or else had to be killed by the Rangers as an act of mercy. Recently two young animals, in an utterly neglected state, had to be destroyed on the Lower Sabie Road. A few old, decrepit specimens also had to be done away with and there were frequent reports of young or fully-grown lions, killed in fights or injured fatally in some other way.

A total of 46 lions (15 males and 31 females) were destroyed during control operations necessitated by circumstances and as protection of life and property. (See table under Predator Control).

During October-November a total of 15 lions was destroyed beyond the boundaries of the Punda Maria section. Recently a deplorable practice was brought to light by the Ranger of the Kingfisherspruit section. One of the farmers on the border dragged zebra or other bait along the boundary of the Park and his farm and then set traps at the carcases. It was maintained that in this manner the person concerned had already succeeded in shooting 16 lions (probably mainly animals from the Park) since the beginning of the year. Fortunately the erection of the proposed border fence will put an end to such practices.

This year the largest number of cubs were reported during the dry season (May-October), yet young cubs were also encountered during December and even during February and March. A lioness, destroyed last year in January, carried 3 developed foeti, which would have been born within about 3 weeks. Carcasses of animals killed by lions, indicate: 165 impala, 82 waterbuck, 95 zebra, 177 wildebeest, 87 kudu, 49 buffalo, 31 giraffe, 10 warthog, 1 sable antelope, 2 roan antelope, 5 tsessebe, 3 eland, 1 mountain reedbuck, 4 reedbuck, 3 bushbuck, 1 klipspringer, 1 nyala, 3 ostrich and one antbear.

With regard to efforts to determine the length of time between kills of the average lion prides, it is interesting to learn from Mr. B. de la Bat that 2 zebra per week are sufficient to satisfy approximately 15-20 lions at Leeubron (Etosha). The animals do not suffer want and additional kills are exceptional. As soon as the lions number 20, a few are driven off. Only 40% of the cubs here reach maturity.

An analysis of the monthly records of the lion numbers observed, is compared with figures for the previous year in the following table:

ESTIMATED NUMBER OF LIONS IN THE KRUGER PARK, MAY, 1959 (BASED ON RECORDS, APRIL, 1958 — APRIL, 1959).

District	Section	Adult Lions		Young Lions	Cubs	Incomplete Records		Total 1959	Total 1958	REMARKS
		M.	F.			Area	Estimated Number			
SOUTHERN	Pretorius Kop	21	28	19	5	—	—	73	64	12 Destroyed.
	Malelane	22	27	13	2	—	—	64	50	3 Destroyed.
	Crocodile Bridge	13	22	17	2	—	—	54	43	10 Destroyed.
	Sabie River from Skukuza—L. Sabie	11	15	18	12	—	—	56	61	
	TOTAL (1)	67	92	67	21	—	—	247	218	—25 Destroyed.
CENTRAL	Tshokwane and Manzentonto	54	84	45	54	—	—	237	193	7 Destroyed.
	Satara and part of Timbavati	38	58	26	19	—	—	141	144	1 Destroyed.
	Kingfisherspruit and Kolwane	28	52	27	18	—	—	125	121	4 Destroyed control & 16 along borders.
	TOTAL (2)	120	194	98	91	—	—	503	458	—12 Destroyed.
NORTHERN	Letaba	29	32	10	3	Letaba River & Letaba-Olifantshoek	10	84	83	9 Destroyed.
	Shingwedzi, Tendi and Shilowa	17	26	21	3	Mapongole-Bububе	5	72	66	—
	Punda Maria	27	37	6	2	—	—	72	69	9 at Pafuri.
	Shangoni and Mahlangene	20	32	15	3	Letaba and Mhyashishe	10	80	76	1 aged lion destroyed.
	TOTAL (3)	93	127	52	11	—	25	308	294	—10 destroyed.
GRAND TOTAL 1, 2 & 3		280	413	217	123		25	1058	970	—47 destroyed.
Percentage propositions		26.47	39.03	20.51	11.63		2.34	99.98		35 Destroyed along Park Borders.

It was attempted to eliminate overlapping between sections in this calculation as far as possible. Of the grand total of 1058, a total of 47, which were destroyed inside the Park, must be accounted for. An estimated number of 35 to 40, destroyed along the borders on private farms and Trust Territory, was taken into consideration where possible in the caldulation of the final totals. If it is accepted that an average of 85 adult lions die annually from natural causes (age), fights, etc., and the mortality amongst the young cubs to be 40% throughout, then the total lion population at present at any time must be between 880 and 900.

SUPER-ORDER — PROTUNGULATA.

ORDER 8 — TUBULIDENTATA.

Family — *Orycteropodidae.*

1. *Orycteropus afer afer* (Pallas) — Antbear.

Judging by the presence of burrows and tracks, the antbear is widely distributed yet not particularly plentiful in any one locality of the Park. Seldom seen during the day and only one specimen has been encountered — at Kumane dam at dusk. The carcass of one, killed by lions, was found.

SUPER-ORDER — PAENUNGULATA.

ORDER 9 — PROBOSCIDEA.

Family — Elephantidae.

1. *Loxodonta africana africana* (Blumenbach) — African elephant.

Before a proper aerial survey of the elephant population of the Park has been completed it is difficult to revise the previous estimate (1958) of the numbers with any certainty. It is thought that this year the 1000 mark has probably been exceeded. There are prospects of slight immigration from Portuguese East Africa during the next few years, but this year, the natural increase has been cancelled out to a great extent by more intensive control measures along the boundaries.

Since April, last year, a total of 22 marauding elephants have been destroyed along the Western and Crocodile River boundaries by officials of the Nature Conservation Section of the Transvaal Provincial Administration, and reports have also been received of 8 shot by Portuguese hunters in the Shingwedzi Poort during March of this year.

The proposed elephant census will be a much more reliable indication of the actual numbers and will serve as the basis according to which the rate of increase will be calculated. In view of the proposed border fence, this information is of the greatest importance, as it is essential that the quantitave control of elephants, which must soon be accepted as an accomplished fact, be planned on a factual and scientific foundation. A thorough survey is being conducted of seasonal movements, reproductive habits, the grazing quality of the habitat, social inclinations and the influence of tourist traffic. A review of grazing habits of elephants, as has been recorded, is given elsewhere.

The following are general observations:

During the dry season, from April to September, the breeding herd of elephants of the Tshokwane section, at present numbering more than 40, visited the Skukuza — Lower Sabie River regions regularly and occasionally joined the smaller herd of 15—17 animals which apparently has a more per-

manent abode in the Nwatimiri bush. The large breeding herd frequently travels up along the Manzendlovu spruit and was seen during the summer months, along the Mutlumubi, in the Lipape area, at Lion Pan, and towards the end of March appeared near Tshokwane for the first time.

An increase in elephant numbers has been reported from the western region of the Olifants River (especially between Nhlarulume and Klaserie mouth) and 5 young calves were observed. This year the small breeding herd, which inhabits the Timbavati-Shisakashangondzo area, moved as far south as Hartbeesfontein and during April 32 were counted at the dam. Smaller herds were observed along the western Manzentonto River, but did not cross the boundary. Groups of bulls or lone elephants were seen frequently in the vicinity of Mlondozi, Nwanetzi, Gudzane and Satara. In the Bangu-poort a herd of about 15 was encountered and seen to climb the steep inclines of the adjacent ridges with amazing ease. Sometimes elephant climb Ship Mountain (June) where they feed on the roots, leaves, and twigs of *Sterculia murex* and *Commiphora harveyi*.

During June the Ranger observed two large herds of 48 and 51 from the Olifants River look-out bathing and drinking in the river.

In the northern regions breeding herds have been recorded at: Mahembane (12), Shidzabane (14), Pafuri (19), 10 miles east of Malopene Gate, Makadze (2 herds of plus-minus 40 each), Ngotse hills (23), between Shingwedzi Poort and Mahlati (66), and along the Letaba River 9 miles circular drive (68 seen from the air).

Towards the beginning of May, elephant returned to Pafuri and in August three lone elephants and a herd of approximately 25 were counted. The latter did much damage in the fever-tree forest, but left after the first summer rains. During this time (August) there were signs that quite a number of elephant was drinking at Shalungwa stream and a cow accompanied by a young calf scattered a patrol of Native Rangers there.

During their search for beacon 8 in the Nyandu bush of the Wambia area, Native Rangers encountered fairly large numbers and had to be continually on the alert for cows with young calves, the former being very aggressive here.

This year, during April, the mechanic of Shingwedzi observed an elephant bull with three tusks, along the river. It had two perfectly formed tusks of about 36 inches in length, one below the other, on the left side.

In the south the dispersal of elephant continues unabated. Last year, for the first time, a calf was born in the Gomondwane bush and during April 2 cows with 2 calves and 2 young animals were seen here. During March and April (1958) a few bulls invaded the Pretoriuskop area as far as the Faai and a point two miles east of the camp, on the Nahpe road. Later five appeared at

Paben and four others moved along the Mnyelene and Nsikazi to Macili. However, no attempt was made to cross the Nsikazi to reach the Trust territory. During August two bulls were active at Shaben and a lone elephant travelled up the Sabie valley to the border fence but caused no damage. Traces of elephant have been noted to within a quarter mile of Pretoriuskop camp.

Aloes (*A. marlothi*) at Doispan and a locality along the Sabie River have been almost completely destroyed and devoured by a herd of elephant (probably the Mtsawu breeding herd).

Groups of 4-12 bulls have been noted in various localities — along the Crocodile River, Gomondwane, the Lebombos, Nwashitsaka and Mbyamide. Elephant tracks are no longer a rare sight in the Machuluane corner.

Last year, during February, there were a few bulls again at Shaben, 3 in the vicinity of Stolznek and a breeding herd of 21 along the Hippo Pool road within 12 miles of Pretoriuskop.

Raids on lands by groups of wandering bulls, in the south along the Crocodile River and along the Sabie River (on the farms Belfast and Lisbon), were cut short by local control measures and by officials of The Transvaal Provincial Administration beyond the boundaries of the Park.

ORDER 10 — HYRACOIDEA.

Family — *Procaviidae*.

1. *Procavia capensis letabae* (Roberts) — Rock rabbit.

In the northern district, rock rabbits have already been found at Pondo Hills, Tsange and Segamila hills, Shingwedzi Poort, and the Lebombos south towards Shilowa, Shangoni Hills, Makadze ridges, Mashetse and Mbyashishe Hills, Shipikane Hills, Matilôlo Koppie, Mala-mala, Mangwa-induna, Shikumbu and Shivulani, Putwane and Mahulule.

So far, Naboomkop is the only locality in the central district where rock rabbits have been found, although it is maintained that these animals were recorded in the past in the Lebombos at Manzentonto Poort and at Mshatu Kop.

In the south the animals are said to occur at Numbi Hill, Ship Mountain, Stungwane, Newu, Sabie Poort, and the Mlambane-Mavugane-Stolznek hills, though this is probably a sub-species of the abovementioned viz. *Procavia capensis coombsi* (Roberts).

2. *Dendrohyrax (Heterohyrax) brucei granti* (Wroughton) — Yellow-spotted dassie.

Abundant locally, but so far recorded only from the Tula-mila ridge from Bobomene to the Hippo Pool and at Klopperfontein. The dassies in the