(iii) The total actual cover percentage of the grasses on the portion which was burnt 6 years ago, is lower than on the neighbouring portion. The total actual cover percentage of edible grasses is, however, higher on the portion which was protected longer against fire.

(b) *Tree and Shrub Surveys.*

(i) The average height of the mopani bush, on the portion burnt 6 years ago, differs considerably from that of the trees on the area burnt 3 years ago. The average height was more than 6 feet on the former compared with 4-5 feet on the latter.

(ii) The average diameter of individual shoots was bigger in the bush groups on the portion burnt 6 years ago.

(iii) The total number of trees (chiefly *Acacia nigrescens)* with single stems (all sizes) was conspicuously higher on the part burnt 6 years ago. (20 as compared with 6).

- (iv) There were conspicuously more bush groups (chiefly mopani) on the portion burnt 3 years ago than on that burnt 6 years ago (153.5 as compared with 102).

The past year was a very favourable one for the production of flowers and seed for most tree species. The Ranger at Punda Maria reported: "Many plants and trees flowered beautifully this year, more than any other year that I can remember." The ranger at Pretoriuskop recorded in his diary as follows :

"16/5/58. Have noticed that kiaat trees this year are carrying far more seeds than usual, some being absolutely laden with them.

20/5/58. As with the kiaat, I also have noticed that the various Combretums are carrying unusually heavy crops of seed, especially C. *suluensis* and C. *hereroense.*

31/7/58. Kaffirboom now flowering in profusion everywhere.

4/9/58. Both white and pink dombeya making a wonderful show this year.

8/9/58. In several places I noted bakhout *(Lannea discolor)* with a profusion of flowers that exceeds anything I have seen before."

In the vicinity of Skukuza it was noted that of all trees *Schotia brachypetala* (tree fuchsia) was exceptionally well covered with flowers.

Some trees varied tremendously in their flowering seasons. A knobthorn tree as well as an African wattle, both in flower were seen on 20/5/1958 in the Pretoriuskop area. Flowering knobthorn and marula trees were seen in the Tshokwane section on May 23. A marula tree with fully developed fruit was found in the Pretoriuskop area on 26 August 1958.

Most of the tree species flowered during September and October. Kaffir-boom (*Erythrina lysistemon*) flowered in July. Seed production was generally good but the following deserve special mention: *Combretum zeyheri; Pterocarpus angolensis* (kiaat), *Peltophorum africanum* (African wattle), *Terminalia sericea* (silver terminalia), *Albizzia harveyi, A. versicolor, Combretum imberbe, C. apiculatum, C. suluense, C. hereroense, Dombeya rotundifolia* (wild pear), *Schotia brachypetala* (tree fuschia) and different types of *acacias*.

## B. THE HERBARIUM AND BOTANICAL SURVEYS.

The herbarium remains a most important instrument of research in the Park. This was carefully checked during the year and many errors eliminated. The specimens at present in the herbarium were compared with the check list compiled by Dr. H. P. van der Schijff and it was found that of the approximately 1,700 plants collected in the Park, nearly 300 were not represented in the herbarium. These were chiefly those collected by Codd, Obermeyer, Lang, Acocks, Bruce and others. Those collected by Van der Schijff, of which no specimens are present, are mainly those of which only a limited number could be collected and all had to be sent to the National Herbarium for identification.

Because specimens of the rarer varieties are difficult to obtain, the National Herbarium was asked to place duplicate specimens at our disposal. It was, however, impossible for the National Herbarium to do this, or even to lend us the specimens, but Dr. L. E. Codd kindly presented us with approximately 1,100 specimens out of his own private collection, which he himself had collected in the Park. This included a large number of species not present in our herbarium, and will shortly be added to it. The kind gesture of Dr. Codd is sincerely appreciated.

The following plants were collected for the first time in the Park during this year.

*Lintonia nutans* Stapf. (Brynard and Pienaar No. 4244).

A grey-green, perennial, sucker-forming grass. It was collected on the Shawu experimental plots, but has also been seen on the Satara plots.

*Neptunia natans* (L.F.) Druce. (Brynard and Pienaar No. 4248).

A small water-loving plant with mimosa-like leaves. The stems consist mainly of spongy tissue, probably to provide buoyance to the floating plant. The leaves are extremely sensitive and contract immediately on being touched. It was collected on the Nwambiane Pan in the Wambia area.

*Pennisetum purpureum* Schum. (Brynard and Pienaar No. 4249).

A large, coarse, perennial grass known as Napier fodder or Elephant grass to agriculturalists. It is indigenous in tropical Africa, but it is planted for

ensilage on a large scale in South Africa. It is possible that it entered the Park from the neighbouring farms on the Sabie River. It was collected at Sabie-Numbi Corner.

*Alloteropsis cimicima* Stapf. (Brynard and Pienaar No. 4250).

A perennial grass of medium size. Collected for the first time in the Pumbe sandveld.

*Vernonia ampla* O. Hoffm. (Brynard and Pienaar No. 4256).

A perennial shrub reaching 6 feet in height with blue composite flowers. Collected at Shipudza.

*Salacia kraussii* (Harv.) Harv. (Brynard and Pienaar No. 4261).

A small shrub locally known as wild peach. The fruit resemble peaches and are eaten by Natives. Collected in the Pumbe sandveld.

*Maytenus putterlickioides* (Loes) Exell and Mendonca. *(Gymnosporia putterlickioides* Loes) (Brynard and Pienaar No. 4263).

A thorny shrublet reaching a height of 6 feet. Flowers appear before the leaves in spring and are white. This plant was collected at Punda Maria, and this is the first record of its existence in South Africa.

*Eugenia zeyheri* Harv. (Brynard and Pienaar No. 4268).

A small shrublet reaching 2 feet in height and resembling

*Salacia kraussii*. Collected in the Pumbe sandveld.

*Bergia* sp. (Brynard and Pienaar No. 4264).

A small prostrate plant with reddish to violet coloured flowers. This species was collected at Machai Pan.

In addition to the abovementioned, a number of rare species was collected which are still to be named by the National Herbarium. A number of fresh water algae and diatoms was also collected but these must still be named.

During the past year distribution registers were compiled for each plant species found in the Park. For this purpose the Park was divided into blocks of 16 square miles each. The registers will be used to record in which of the blocks each plant species has been collected, comparative abundance, notes about the habitat, geological formations, etc. The data will later be reproduced on a distribution chart, which will be compiled for each plant species.

It will be realised that this is a very long term project but the information thus collected will be of enormous value in determining the carrying capacity of certain areas of the Park, or of the Park as a whole, if coupled with the knowledge of the distribution of the different animal types, the density of the population, their feeding habits, etc.

## C. EXOTIC PLANTS AND EXPERIMENTS WITH THE ERADICATION OF ENCROACHMENT PLANTS.

The uncontrolled propagation and distribution of some exotic plants is considered by the Biological Section as a serious matter and active steps were taken during the past year to curb further dissemination.

In the first instance a number of experiments were conducted with chemical weed killers to try and establish a method to kill these plants economically. Secondly in a report to the Board, it was pointed out that all the work done in the Park would be futile, if nothing was done in the areas from which redistribution was possible. The Board laid down the policy (Board Resolution No. 90 of 9/12/1958) that no staff member may grow any of the following plants, which are a potential danger to the Park, either in private gardens or in Rest Camps, and where these do exist, they must be removed and destroyed without delay: *Melia azedarach* (lilac tree), *Opuntia vulgaris* (prickly pear), *Opuntia aurantiaca* (jointed cactus), *Lantana camara* (lantana), *Eichornea crassipes* (water hyacinth), *Populus* sp. (poplars), *Solanum auriculatum, Acacia decurrens* var. *mollis* (black wattle) and *Nicotiana glauca* (wild tobacco).

Experiments to test the effectiveness of weed killers were conducted on the following plants: *Melia azedarach, Lantana camera, Opuntia vulgaris* and *Nicotiana glauca*. The effect of the weed killers was also tested along the Lower Sabie road on an indigenous plant species viz. *Dichrostachys glomerata,* because this bush is at present encroaching on other vegetation along that road. The Biological Section hoped to obtain a selective means of control to forego the use of such unselective means as fire or bulldozers.

The following experiments were conducted with the firm Klipfontein Organic Products (KOP); the firm kindly supplied the weed killers and transport free of charge and lent the necessary apparatus for the work.

(a) *Melia azedarach* (Syringa or Lilac tree).

(i) *Conditions of trees at the time of the experiment.*

The experiments were conducted during November, 1958. All trees were in full leaf and had just finished flowering. Green berries were seen on some trees.

*(ii) Weed killers used.*

*KOP 250* : (Concentrated solution). Contains 60% 2, 4, 5-T as active ingredient.

*C.S. 301* : Contains 60% 2, 4, 5-T as active ingredient.

*Iso-Octyl Ester* : Contains 60% of this ester of 2, 4, 5-T as active ingredient.

*Ethyl Glycol Ester* : Contains 15% of this ester as active ingredeint.

*(iii) Concentrations applied.*

Of all the weed killers, two concentrations viz. 0.75% and 1.50% were prepared and applied. All weed killers were dissolved in dieseline.

*(iv) Quantities applied.*

Of the concentrations two quantities viz. ½ pint and 1 pint per tree were applied.

*(v) Number of Trees treated.*

Five trees were treated with each quantity, therefore with the two concentrations and four types of weedkiller a total of 80 trees was treated.

*(vi) Method.*

The bark of each tree was chopped with an axe at a height of 6 inches above the ground in such a way that it was broken right round the stem. This was done to ensure that the weed killers would be able to penetrate. The weed killers were then applied by means of a special pump. A strip of 9 inches to 1 foot was sprayed round the stem.

*(vii) Observations and results on 31/3/1958.*

After about 5 days the leaves of the treated trees began to wilt and fall off. The young leaves were already slightly discoloured and curled up. On the tenth day after treatment, some of the trees had lost nearly all of their leaves. Of all the weed killers KOP 250 (especially the higher concentration and 1 pint quantity) had the fastest injurious result on the trees and the Iso-Octyl Ester the slowest.

Recent observations are given in the table below. It must be pointed out that these must not be considered as final. Only after the next growing season would it be possible to say if the trees are completely dead.

| Weed Killers | 0.75% | | 1.50% | |
|---|---|---|---|---|
| | ½ Pint | 1 Pint | ½ pint | 1 Pint |
| KOP 250 | 3 trees dead 2 sprouting from roots | 5 trees dead | 5 trees dead | 5 trees dead |
| C.S. 301 | 2 trees dead 1 sprouting from roots and 2 still growing | 3 trees dead 2 sprouting from roots | 5 trees dead | 5 trees dead |
| Iso-Octyl Ester | 4 trees dead 1 sprouting from roots | 5 trees dead | 5 trees dead | 4 trees dead, 1 sprouting from roots |
| Ethyl Glycol Ester | 5 trees dead | 5 trees dead | 4 trees dead 1 sprouting from roots | 5 trees dead |

Where trees were recorded as dead in the above table, the stems and branches were completely dried out. The bark was loose and could easily be removed. Some of the smaller treated trees (trunk diameter 6-8 inches) were easily moved and pushed over, and the chances that such trees would ever grow again, either from their roots or branches, are very slight.

(b) *Nicotiana glauca* (Wild tobacco).

*Nicotiana glauca* entered the Park via the Olifants River. It grows chiefly on deep silt deposits along the banks of the Olifants River, which are now infested over nearly their entire lengths.

(i) *Condition of plants at the time of treatment.*

The plants had reached advanced growth and some were 10 feet high at the time of treatment. All plants were very green and most were in flower; others had already produced seed. The experiments were conducted during November, 1958.

(ii) *Weed Killers used.*

Only one weed killer, viz. KOP 24, containing 48% Iso propyl ester of 2, 4-D, was used.

(iii) *Concentrations applied.*

Five different concentrations were tried, viz. 0.375%, 0.50%, 0.75%, 1.00% and 1.50%. The weed killer was dissolved in water.

(iv) *Quantities applied.*

Each concentration was applied in the proportion of 50 gallons per morgen.

(v) *Method.*

Five plots, each 20 x 20 yards, i.e. 400 square yards in size, were measured out on the south bank of the Olifants River and near Gorge. The plots were separated from one another by paths of 3 feet wide. All plants were treated as equally as possible with the weed killer which was applied by means of a spray pump.

(vi) *Observations and Results.*

It was soon evident that the weed killer had no marked effect on the plants. Where the weed killer had come in contact with the plant, the leaves and stems turned brown, but the portions of the plant which did not come in direct contact with the weed killer, remained unaffected. The strongest solutions had the greatest effect, but even these were unable to destroy the plants completely and experiments with even stronger solutions of 2, 4-D or 2, 4, 5-T are being contemplated. Treatment might have been more effective if the plants had been younger.

The wilted parts of the abovementioned plants were attacked by large numbers of black-spotted beetles *(Malabris? oculata)* which removed the

outer bark layers. It was obvious that these beetles did not attack the untreated plants.

(c) *Opuntia vulgaris* (Prickly Pear).

*Opuntia vulgaris* is found in certain places in the Park and is spreading.

A number of prickly pear plants in the neighbourhood of Skukuza were treated with a 1.5% solution of KOP 250 dissolved in dieseline. The whole plant was sprayed with the solution. The treatment was applied on a hot, humid day in November, 1958.

*Observations and Results.*

Roughly 5 days after the spraying the plants were wilted and stems were hanging. After 10 days most plants had started to fall over and had turned to a blue-black colour.

Observations made recently showed that most plants were already dead, and their chances of growing again must be ruled out.

(d) *Lantana camara* (Lantana).

*Lantana camara* is now to be found near most rest camps, having spread there from gardens. In the vicinity of Skukuza it is rapidly becoming a problem.

Two plots (each roughly 100 sq. yds. in size) where *Lantana camara* was growing profusely, were treated with different hormone weed killers. The one plot was treated with a 0.75% solution of 2, 4, 5-T mixable oil concentrate (Butyl Ester) in water and the other with a 0.75% 2, 4-D solution (Iso propyl ester) in water. The quantities used in both cases were in the proportions of 50 gallons per morgen.

The spraying took place on a very hot day in November, 1958. All plants were fairly young and in flower.

*Observations and Results.*

Five days after the treatment, most leaves which came in contact with the spray had begun to wilt. After 10 days it seemed that the 2, 4-D solution had had a greater detrimental effect on the plants than 2, 4, 5-T.

After roughly one month all the aerial parts of the plants treated with both solutions were dead.

After approximately two months most of the plants had started growing again from the roots, but the growth was not very vigorous and it is evident that a second spraying would kill the plants completely. Unfortunately this was impossible because, due to a misunderstanding, the camp supervisor had already cleared the plots with a gang of labourers.

(e) *Dichrostachys glomerata* (Sickle bush).

*Dichrostachys glomerata* is inclined to encroach on certain veld types. It is partly responsible for the dense shrub barrier along the Lower Sabie road.

The Board had at one stage expressed its concern about the dense bush growth along this road and considered the proposals either using bulldozers to clear the bush, or to use the driftwood left by the 1958 floods, to help with the burning of this dense growth. Neither of these proposals seemed acceptable and it was decided to experiment with weed killers to try and thin out this dense community in a more selective manner.

Experiments with weed killers were conducted along the Lower Sabie road during November, 1958.

(i) *Condition of trees at the time of treatment.*

The sickle bush were not fully in bud at the time of treatment but most had young leaves and the majority were in flower.

(ii) *Weed Killers used.*

Only one weed killer, viz. KOP 250 (concentrated solution) was used.

(iii) *Concentrations applied.*

Four different concentrations of KOP 250 were applied, viz. 0.5%, 0.75%, 1.0% and 1.5%. The weed killer was dissolved in dieseline.

(iv) *Quantities applied.*

Of each concentration the following quantities were applied: $\frac{1}{8}$ pint, $\frac{1}{4}$ pint and $\frac{1}{2}$ pint. Ten trees were treated per quantity, i.e. 30 trees per concentration. Altogether 120 trees were treated.

(v) *Method.*

The method of application was the same as for *Melia azedarach* except that the bark of *Dichrostachys glomerata* was not broken before the stems were sprayed.

(vi) *Observations and Results.*

Five days after treatment, the leaves of the plants treated with the higher concentrations and larger quantities had begun to change colour and curl up. By the tenth day most plants were severely affected and most leaves were discoloured and curled up. It was noticed, however, that different trees (even those which had received identical treatment) reacted differently.

Approximately one month after the treatment most plants had lost their leaves.

Preliminary results, based on recent observations are tabulated below. Final results will be given at a later stage.

*Preliminary results of experiments on DICHROSTACHYS GLOMERATA with Weed Killer (KOP 250).*

| Concentrations | QUANTITIES APPLIED | | | | | |
|---|---|---|---|---|---|---|
| | ⅛ Pint | | ¼ Pint | | ½ Pint | |
| | % Dead | % still growing | % Dead | % still growing | % Dead | % still growing |
| 0.50% | 90 | 10 | 100 | 0 | 90 | 10 |
| 0.75% | 100 | 0 | 100 | 0 | 80 | 20 |
| 1.00% | 100 | 0 | 100 | 0 | 100 | 0 |
| 1.50% | 90 | 10 | 100 | 0 | 100 | 0 |

## 2. REPRODUCTION.

### 1. REPRODUCTION AND BREEDING (MAMMALS).

A thorough knowledge of the normal reproductive processes and the breeding habits of his charges, is of the utmost importance to the nature conservator, although the collecting of exact data in this respect is generally a difficult and time-robbing task. Under natural conditions it is essential to depend on chance recordings and it is, therefore, extremely valuable that the co-operation of the Rangers has been obtained.

Data which was collected during the past year, is recorded below in chronological order.

| DATE | SECTION | OBSERVATION |
|---|---|---|
| 20.1.58 | Tshokwane | The first waterbuck calves seen along the Harashu River. |
| 25.1.58 | Pretoriuskop | The first kudu calf of the season seen near Pretoriuskop. |
| 18.2.58 | Tshokwane | First kudu calf of the year seen near Saliji. |
| 11.3.58 | Pretoriuskop | A wildebeest cow served by a bull. |
| 13.3.58 | Pretoriuskop | Two fighting sable bulls found near Faai — start of the mating season. |
| 17.3.58 | Pretoriuskop | Large numbers of kudu calves seen all over section. |
| 1.4.58 | Tshokwane | A very good calving season for waterbuck |

| DATE | SECTION | OBSERVATION |
|---|---|---|
| | | over in the Mlondozi and Shingedzene areas. |
| 12.4.58 | Skukuza | Found a female cheetah with a partly grown cub at Skukuza hills. |
| 14/15.4.58 | Tshokwane | Impala rams fighting, have already chosen ewes. |
| 18.4.58 | Pretoriuskop | Impala rams killed in fight found — mating season in full progress. |
| 3.5.58 | Tshokwane | 2 Young hyaenas (± 2 months old) seen at Leeupan. |
| 8.5.58 | Crocodile Bridge | A cheetah female with 4 cubs found near Crocodile Bridge. |
| 10.5.58 | Skukuza | Two young cheetah cubs on Doispan Road, eight miles from Skukuza. |
| Beginning May '58 | Shingwedzi | Porcupines mating at Boyela. |
| | Shingwedzi | Serval cat with partly grown young also at Boyela. |
| 21.5.58 | Crocodile Bridge | Warthogs trying to mate at Nsosweni waterhole. |
| 3.6.58 | Crocodile Bridge | Lions mate next to Randspruit road. |
| 16.6.58 | Satara | 2 Young cheetahs found next to Mavumbye. One very weak and partially paralized — destroyed by Ranger. |
| 19.6.58 | Tshokwane | A Leopard with 3 young cubs (± 1 month old) at Manzi-mahle. |
| 26.6.58 | Letaba | A steenbuck lamb (± 1 month old) found at Olifants River look-out. |
| 1.7.58 | Skukuza | A hyaena breeding hole with 3 young (± 2 months old) uncovered 14 miles from Skukuza on the Nahpe road. |
| 9.7.58 | Skukuza | A young caracal seen 4 miles north of Sand River Bridge along western boundary road. |
| 18.7.58 | Pretoriuskop | 12 roans with 4 very young calves (± 2 months old) seen at Sithlabe next to Nahpe road. |
| End of July | Skukuza | A partially grown duiker lamb (2-3 months old) seen on Lower Sabie road. Mating was observed in this area in December, 1957; a gestation period of 4 months is indicated. |

| DATE | SECTION | OBSERVATION |
|---|---|---|
| 11.8.58 | Skukuza | A partially grown steenbuck lamb next to Nahpe road 14 miles from Skukuza. |
| 14.8.58 | Punda Maria | A martial eagle caught a young duiker lamb on the eastern border between Pafuri and Malonga. |
| 1.9.58 | Shingwedzi | A nyala ewe with young lamb found at Dzombo windmill. |
| 12.9.58 | Tshokwane | The first tsessebe calf of the season in Lipape area. |
| End of September | Punda Maria and Shangoni | Eland calves arriving in numbers along the western boundary in both sections. |
| 20.10.58 | Letaba | The first 4 tsessebe calves with 7 adults found at Malopanyana windmill. |
| 24.10.58 | Skukuza | A very early arrival (first of the season) of an impala lamb seen on Doispan road, east of the knobthorn forest. The 28th October is the earliest record by Stevenson-Hamilton. He writes: "The young ewes lamb several weeks after the older ones, and there seems to be a period between the end of November and the second week in December, when very few lambs are born. Since the mating season does not last much over a month (mid-April-mid-May), and the lambing time frequently extends to nearly two, it seems as if the period of gestation in the wild state varies from between $6\frac{1}{2}$ and 7 months, relative to the age of the ewes, and the earliness or otherwise of rain". |
| Winter report | Tshokwane | During April 4, May 9, June 4 and August 1, lion cubs were recorded in this section. |
| 31.10.58 | Sabie-Sand Block | Four ruttish giraffe cows seen. Mating occurred. |
| 3.11.58 | Tshokwane | First three small warthogs seen on Sabie road. |
| 3.11.58 | Pretoriuskop | First impala lambs found along Nahpe road. |
| 3.11.58 | Satara | First waterbuck calf of the season seen at Gudzane dam and first impala lamb at Nwanetzi. |

| DATE | SECTION | OBSERVATION |
|---|---|---|
| 3.11.58 | Skukuza | A bushbuck ewe with lamb (± 1 month old) found at Nwashitsaka drift. |
| 5.11.58 | Pretoriuskop | Young waterbuck calves seen at Kamban. |
| 6.11.58 | Tshokwane | First impala lambs seen between Sand River and Mutlumubi. |
| 10.11.58 | Malelane | First small warthogs of the season (6) found with sow along Crocodile River. |
| | | Newly born zebra foal killed by leopard. |
| 11.11.58 | Pretoriuskop | Two newly born impala lambs on Faai circular drive. |
| 13.11.58 | Tshokwane | A group of small warthogs opposite Nwamuriwa turn-off. |
| 15.11.58 | Malelane | First impala lambs seen at Hlambamaduba. In the same vicinity two small bushbuck were seen. |
| 17.11.58 | Pretoriuskop | The first wildebeest calf of the season found between Klein Faai and the rest camp. |
| 17.11.58 | Letaba | A waterbuck cow with small calf seen near rest camp. |
| | | Four young impala lambs seen between Olifants River and Letaba. |
| 18.11.58 | Punda Maria | A newly born zebra foal recorded at Klopperfontein. |
| 19.11.58 | Punda Maria | An impala ewe with twin lambs found at Pafuri. |
| 23.11.58 | Sabie-Sand Block | The first wildebeest calves recorded from this area. |
| 24.11.58 | Pretoriuskop | A prematurely born kudu calf found at Shaben dams. |
| 24.11.58 | Tshokwane | First wildebeest calf seen at Tshokwane. |
| 24.11.58 | Tshokwane | A small civet, a few days old found in the palms along the Hutomi spruit. |
| 24.11.58 | Tshokwane | A wildebeest calf at Mareyo windmill. |
| 30.11.58 | Tshokwane | A number of young wildebeest calves recorded along the Hutomi road. |
| November 1958 | Malelane | 2 small herds of red rhebuck found in the mountains around Machuluane each with a lamb of ± 1 month old. |
| 2.12.58 | Skukuza | 2 young wildebeest calves recorded on Doispan road. |

| DATE | SECTION | OBSERVATION |
|---|---|---|
| 6.12.58 | Skukuza | A bushbuck lamb of 1-2 months old found along the Lower Sabie road. |
| 6.12.58 | Crocodile Bridge | The first waterbuck calf of this section seen in veld west of Mpemana waterhole. |
| 8.12.58 | Tshokwane | A very young zebra foal seen with herd. |
| 9.12.58 | Kingfisher-spruit | A few very young giraffe calves and zebra foals seen in vicinity of Mahlobyanine. |
| 1.1.59 | Pretoriuskop | A young waterbuck calf found at Manung dam. Four days earlier another was seen at Nahpe dam. |
| 4.2.59 | Skukuza | A nest of a dwarf mouse (*Mus minutoides*) with 6 babies found at Skukuza. The mother started to dig another burrow immediately after the nest was uncovered. |
| 7.2.59 | Letaba | Two very young Cape wild cat kittens found in a hollow tree trunk near Olifantsriver Bridge. |
| 10.2.59 | Tshokwane | Young waterbuck calves found at Orpen Dam in Mlondozi area. |
| 12.10.59 | Punda Maria | A zebra mare gives birth at Klopperfontein. |
| 18.2.59 | Letaba | The first kudu calves of the season. |
| 19.2.59 | Malelane | Badgers mating at Mlambane drift. |
| 20.2.59 | Pretoriuskop | Warthogs had a pood breeding season in this section. |
| 21.2.59 | Tshokwane | The first sable calf of the season in a herd of 8 at Tablet Hill. |
| 21.2.59 | Punda Maria | Young waterbuck calves in prominence at Pafuri. |
| 23.3.59 | Pretoriuskop | The first sable calf on this section recorded from Macili and another at Numbi. |
| 3.4.59 | Tshokwane | Wildebeest mating at Leeupan. |
| 18.4.59 | Kingfisher-spruit | A number of young giraffe calves seen on Orpen-Satara road and along western boundary. |
| 27.4.59 | Tshokwane | Impala mating season had started. |
| 30.4.59 | Crocodile Bridge | Two porcupine females with very young babies (2 and 3 respectively) seen at Gomondwane. |

The breeding habits of elephants are given special attention. According to information collected by Carrington it appears that an elephant cow rears up to 12 calves during her life span. (Some authorities maintain even more).

The gestation period varies from 20 to 21 months and a cow will not calf more than once every 3 years. Twins are sometimes born, but this is a rare ocurrence.

It appears as if there is no regular breeding season and cows are served at any time during the year. (It was found in the case of the Indian elephant, the majority of the cows became ruttish during the period December to February).

The mortality amongst the calves of the Indian elephant is in the vicinty of 25% as a result of the predations of Bengal tigers, though this figure is most probably much lower in the case of the African elephant because lion will rarely attempt the killing of a young elephant calf if other prey is available.

After 3-4 months the cow starts to wean the calf, although it does happen that they are suckled for a longer period, depending on whether the mother will allow this.

## 3. POPULATION FACTORS AND INFLUENCES.

### A. ANIMAL DISEASES AND CASUALTIES.

A chronological resumé of the animal diseases and casualties which were reported during the past year reads as follows:

19.3.58 A report was received that the Foot and Mouth Disease epidemic in the Portuguese territory at Chicuala-cuala, Mapai and Maxaila was under control.

20.3.58 Two waterbuck calves found dead near Pongola. They were very thin and covered with ticks.

28.3.58 A leopard was killed in a fight near the Ranger's quarters at Malelane.

4.4.58 The Ranger at Tshokwane destroyed a young male lion which was in a very bruised condition (most probably kicked by a zebra). Its mouth, neck and left front paw were full of porcupine quills.

17.4.58 A very thin, weak leopard was destroyed near the Letaba compound after it had nearly succeeded in catching a native labourer. Its neck and shoulders were full of porcupine quills.

18.5.58 A fresh carcase of a spotted hyaena killed by a lion was found next to the Gomondwane road. Vultures were busy feeding on it.

16.6.58 Two young cheetah cubs were found along the Mavumbye fire-break road. One was very weak and partially lame and was destroyed by the Ranger.

June to August, 1958 It was repeatedly reported that the game at Pafuri (especially impala, but also nyala, kudu and bushbuck) were in poor condition, covered with parasites and showed hairless patches on the skin. During a visit to this area in August an impala ewe, which was in an extremely poor condition, was destroyed. The animal was very thin and the skin in places completely hairless. The skin, especially on the face, in the groins and below the tail was covered with innumerable ticks. The bare patches on the skin were probably caused by the animal rubbing against trees in attempts to free itself of the ticks. (There were acacia thorns imbedded in the skin and some had penetrated deep into the muscle tissues). Skin samples sent to Onderstepoort showed, that except for a slight degree of hyper-keratosis, there were no signs of either inflamation or the presence of ectoparasites (such as the scabies mite).
The ticks were of the following species: *Rhipicephalus appendiculatus, Amblyomma hebraeum, Boophilus decoloratus* and *Rhipicephalus evertsi* — all types which could be expected in this region and only the degree of infestation must be considered as abnormal. The muscular tissues, especially those of the ribs and back, were infected with 'measles' most probably of *Taenia bubesei*, and specimens were collected from the heart and rib muscles. Unfortunately this material as well as liver samples and connective scar-tissue with slender wormlike parasites (possibly *Cooperiodes hepatica)* were lost at Onderstepoort, so it was impossible to have the identifications. The lungs, spleen and other organs appeared to be normal.

It had been recorded that animals (especially kudu and impala) lick the soil at the bases of large pointed antheaps during the winter months. Samples of this soil and also of the surrounding silt were collected and sent to the Chemical Services Section to be analysed. It appeared that the soil of the anthills had an appreciably higher pH than the surrounding topsoil, (7.9 compared to 6.8). It also contains a considerably higher concentration of hydrochloric acid soluable free carbonate and sodium and also a higher concentration of accessible plant nutritious matter (Citric acid soluble) such as carbonate, phosphorus, potassium, calcium, magnesium and nitrogen.

REPORT ON SOILS OF THE PAFURI SECTION OF THE KRUGER PARK ANALYSES

TOTAL SALTS (Hydrochloric acid soluble)

| Sample No. | Pafuri Anthill 1 | Pafuri Anthill 2 | Bag marked: Pafuri 1 Label marked: Pafuri 2 | Bag marked: Pafuri 2 Label marked: Pafuri 1 |
|---|---|---|---|---|
| Lab. No. | M623/58 | M624/58 | M625/58 | M626/58 |
| Texture | Clay | Clay | Fine sandy clay silt | Fine sandy clay silt |
| pH | 7.8 | 7.9 | 6.8 | 6.8 |
| Resistance in Ohms | 60 | 50 | 750 | 700 |
| % Free Carbonate | 0.3 | 0.3 | 0.0 | 0.0 |
| % Sodium | 0.361 | 0.391 | 0.101 | 0.106 |
| % Potassium | 0.250 | 0.254 | 0.223 | 0.226 |
| % Magnesium | 0.655 | 0.479 | 0.554 | 0.471 |
| % Phosphorus | 0.051 | 0.040 | 0.043 | 0.038 |
| % Calcium | 0.751 | 0.931 | 0.692 | 0.700 |

AVAILABLE PLANT NUTRITIOUS MATTER (Citric Acid Soluble)

| Sample No. | Pafuri Anthill 1 | Pafuri Anthill 2 | Bag marked: Pafuri 1 Label marked: Pafuri 2 | Bag marked: Pafuri 2 Label marked: Pafuri 1 |
|---|---|---|---|---|
| Lab. No. | M3623/58 | M624/58 | M625/58 | M626/58 |
| Texture | Clay | Clay | Fine sandy Clay silt | Fine sandy Clay silt |
| pH | 7.8 | 7.9 | 6.8 | 6.8 |
| Resistance | 60 | 50 | 750 | 700 |
| % Free Carbonate | 0.3 | 0.3 | 0.0 | 0.0 |
| % Phosphorus | 0.015 | 0.015 | 0.008 | 0.009 |
| % Potassium | 0.023 | 0.025 | 0.009 | 0.009 |
| % Calcium | 0.278 | 0.275 | 0.164 | 0.200 |
| % Magnesium | 0.071 | 0.078 | 0.061 | 0.054 |
| % Nitrogen (Total) | 0.092 | 0.091 | 0.079 | 0.084 |

It would appear as if the reason for the weakening in the condition of the animals during the winter months must be the lack of certain essential mineral salts in the diet, or a possible trace element or vitamin deficiency caused by the very meagre diet of the animals during this period.

This matter is receiving further attention.

21. 6.58 The carcass of an elephant cow was found at Shipikane Mouth. The reason for the death was not established.

25. 6.58 The carcass of an impala ram was found in the reeds along the Crocodile river. Death was due to snake bite.

26. 6.58 A giraffe bull with a broken neck was found at the Saliji turnoff. The break had healed about 2½ foot from the head and caused a large bulge on the righthand side of the neck. The animal is in excellent condition in spite of this affliction but it appears that the neck could easily break again.

26. 7.58 An elephant bull was killed in a fight at Shimarigwani in the Shangoni section.

8. 8.58 Two lion were caught in snares in Mhinga's location.

13. 8.58 A martial eagle caught a duiker lamb on the Eastern boundary between Pafuri and Malonga.

14. 8.58 A lion trapped in a snare in Portuguese territory broke away and could not be found.

26. 8.58 The Ranger at Pafuri was informed about a severely crippled elephant. On his arrival he found the animal without foot pads. These pads were later collected within 300 yds. (close to one another) from where the elephant was standing. The elephant was destroyed and it was found that it was walking on raw stumps. This animal was probably trapped in a bush fire which had raged in the Portuguese territory a few days previously, and it had walked across the white hot coals and hot sand. The trunk showed burns too. Ticks found on its ears were identified as *Amblyomma thalloni* (the elephant tick).

28. 8.58 Three kudu bulls were found dead close to one another on the Nyala road (Pafuri). The reason for these deaths was not established.

28. 8.58 Two wildebeest were found dead at Paben and Mbulweni. Both were thin, infested with ticks, and the flesh nearly colourless — so bad that even the natives refused to eat it.

3. 9.58 Several cases of rabies were reported in Mhinga's location. None from the Park.

18. 9.58 A waterbuck was killed by hyaena near Pretoriuskop rest camp, after it had suffered crippling wounds in the hind quarters.

29. 9.58 A large giraffe was found dead at Mtjulu — the reason given was a bite from a mamba.

11.10.58 A giraffe bull and an impala ram succumbed in a veld fire which destroyed the Ngotsa spruit area. A sable bull with burns on its hind quarters was seen but these were not serious. A fair number of giraffe with wart-like growths (Papillomata) on the skin were seen during the winter—these, however, disappeared leaving no serious damage.

19.10.58 A hippopotamus bull killed in a fight at Paben.

24.10.58 The carcase of a serval cat found at Nahpe. Later in the year a similar case was reported along the Ngiriwane fire-break road. In both cases it was impossible to establish the cause of death.

9.10.58 A hippopotamus bull died of wounds in the Klein Letaba at Mbyashihe picket.

11.11.58 A fully grown maned lion had to be destroyed at Leeupan because its back had been broken by another.

18.11.58 A hyaena and two vultures were found at Tuti picket near the western boundary, poisoned by persons unknown.

19.11.58 News received that foot and mouth disease had broken out at Guija and Chibuto in Portuguese East Africa, roughly 80 miles south of Satara.

20.11.58 A wildebeest cow which had tried to jump through the fork of a tree, was caught and died there.

27.11.58 *Foot and mouth disease in the Park!*
Two impala rams, one of which was cripple, were shot in the vicinity of the Semane windmill on the Orpen-Satara road. The palate of the crippled one showed raw sores and there were festering wounds above the hoofs. The Ranger reported this and the Parks authorities immediately approached the Division of Veterinary Services to have the matter investigated. On the 2nd and 3rd December a number of suspected cases of foot and mouth disease were found on an inspection tour with the acting District Veterinary Officer, in the vicinity of Tshokwane, Orpen dam, Leeupan and along the northern Hutomi road. It was noteworthy that at this stage only adult and year-old lambs were affected. No crippled lambs of this year were seen. The affected animals were limping very badly and some showed secondary infection and festering wounds on the hoofs, which must have caused much pain when walking. A few were found lying down. Of the 9 buck destroyed during this time, 6 were limping and all six had lesions in the mouth (especially on the upper gums and

the labial mucuous membrane) and also along the hairline of the hoofs.

One specimen shot at Lion Pan had developed "blisters" on the gums and nasal mucous membrane. Epithelium and pus from the feet were collected in a buffer solution and sent to England. (These specimens, however, became contaminated and were worthless. Samples of the live virus was subsequently collected and identified as S.A.T.3).

On December the 4th an impala was destroyed on the Hutomi road with newly developed "blisters" in the mouth, nose and labial mucosa of the upper and lower jaws Samples collected were also sterile. A suspected case was found between Nwanetzi and Satara and the disease had then spread as far south as the Skukuza airfield. On December the 8th the first lamb was seen to be limping along the Hutomi road. A buffalo in a herd of plus minus 200 on the Hutomi road was also limping, but it was impossible to establish the reason. The epidemic in the Tshokwane area had subsided and the buck which had been affected, had nearly recovered. A suspected case was reported between Skukuza and Malelane, i.e. the first south of the Sabie River. On December the 9th, sick animals were found as far west as Sarabank, Mahlobyamine and Rabelais and shortly after this the disease also spread to the Sabi-Sand Reserve and neighbouring farms.

A young ram was shot at Rabelais with the first typical lesion on the dorsal surface of the tongue. One day later another case was found south of the Sabie along the Nahpe road. For some unknown reason, however, the disease did not spread westwards towards Pretoriuskop, but south-eastwards (along the railway line) towards Crocodile Bridge. (Several suspected cases were seen at Randspruit on 14th December).

Immediately after this, the staff members of the Biological Section went on leave and the investigation was taken over by the Senior State Veterinarian of the Lydenburg district, who is still responsible for this. For the sake of completeness the following data are given:

On the 17th December the first two limping wildebeest were seen at Hartbeesfontein along the western boundary, and 10 days later another one on the Orpen-Satara road. In all three cases it was impossible to establish if the animals were suffering from foot and mouth disease. On the 26th December limping impala were seen along the Voortrekker road (in the South) and near Gomondwane, and also a lame buffalo north of Crocodile

Bridge. A few days later a large number of limping impala were found between Tshokwane and Saliji. On January the 15th, impala and a wildebeest heifer were destroyed at Kingfisherspruit, Rabelais and the Western boundary, all showing the characteristic foot and mouth disease lesions.

An affected impala was found on the eastern boundary near Mbadze on January the 27th and Native Rangers reported for the first time that young lambs were dying of this disease at Nwanetzi. (5 Carcasses were found here in one week). Later (31st January), further communications mentioned the dying of lambs at Nwanetzi but there was already a decrease. It can be mentioned here that these were the only records of carcasses of animals having succumbed, which were found in the whole area (inside the Park). In contrast with this, the news from the Sabi-Sand Block was that a large number of carcasses were found, particularly of young animals. The reason for this is obvious—as soon as a buck (adult or lamb) contracts the disease it becomes easy prey to predators. Outside the park predators are destroyed, with the result that buck die of the disease, and the chances are better for the carcasses to be found.

The rôle of the predator here was a very valuable one. Not only did they destroy the weaklings in the herd, but they also caught the sick animals and in this way prevented the spreading of the disease. It was evident after the crisis that, with a few exceptions, the disease had no marked effect on the crop of lambs as compared to unaffecetd areas. In other words the natural mortality amongst lambs was not accentuated by the foot and mouth epidemic, and the number which was directly or indirectly killed by the disease, had no marked effect on the normal deaths of healthy lambs which ordinarily would have been subjected to predation. The same applies to adult animals which had contracted the disease, but it appeared as if their chances of survival were greater except if secondary infection was severe.

During February further infection amongst impala was found in the central and southern disrticts and also the first case north of the Olifants River near the Gorge. A few limping warthogs were seen north of Mazite and at the drift of Hutomi spruit.

On the 18th February three impala with foot and mouth disease lesions were shot on the Letaba-Olifants River road and a limping waterbuck bull was seen on the Olifants patrol road.

No signs were found that other animals, except those mentioned (and sable outside the Park), were affected and the disease did not spread north of the Letaba River. Although impala were still found up to early in April, showing healing lesions of foot and mouth disease (especially in the southern districts) it appears as if the disease is slowly disappearing.

15.12.58 A dead elephant was found 3 miles south of Kostine's picket. The reason for the death could not be established.

18.12.58 An impala lamb, which according to the signs, was killed by a badger, was found at Rabelais dam.

5. 1.59 Impala at Zabala (Crocodile Bridge Section) very heavily infested with ticks.

28. 2.59 An impala lamb behaving in a strange way was found between the Sabie and Sand Rivers. It was partially paralysed. It was swaying to and fro and on falling over would kick. There were no signs of external parasites or ticks in the ears.

2. 3.59 A Native Ranger found a second dead wild dog in the Sabie-corner area. It was badly savaged, probably in a fight.

13. 3.59 A young lion left by the pride was found dead as a result of starvation at the Tablet Hills.

14. 3.59 Another young lion, too weak to move, was destroyed near Tshokwane.

26. 3.59 A sable bull killed in a fight in Numbi area.

16. 4.59 Two very neglected young lions destroyed along the Lower Sabie road. Parasites and pathological samples were collected.

21. 4.59 The carcass of a young Hippo calf was found in the Sabie at Skukuza. It was evidently killed by an adult.

During May last year, an officer of the Plague Research Unit of the Medical Research Institute, collected a number of rodents at Skukuza.

All types of ecto-parasites found on these animals were collected for identification. The following fleas and lice have been identified.

| HOST | FLEAS | LICE |
|---|---|---|
| *Tatera schinzi limpopoensis* (Roberts) | *Xenopsylla frayi*<br>*X. brasiliensis* | *P. biseriata* |
| *Rattus (Aethomys) chrysophilus tzaneenensis* (Jameson) | *X. brasiliensis*<br>*Dinopsyllus* sp. | |
| *Rattus (Praomys) namaquensis drakensbergi* (Roberts) | *Listropsylla prominens*<br>*Xenopsylla brasil-liensis* | |
| *Rattus (Mastomys) natalensis microdon* (Peters) | *Dinopsyllus longi-frons lypusus**<br>*Xenopsylla frayi* | *P. biseriata* |

* *D. longifrons lypusus* has not been collected in the Park previously.

## B. THE GRAZING HABITS OF MAMMALS IN THE KRUGER NATIONAL PARK.

A calculation of the carrying capacity of a specific area or of the Park as a whole, is quite impossible without a thorough knowledge of the grazing habits of the different animals, the different types of foods, food chains, and the quantities of food needed by each type daily and the ratio in which different kinds of foods are needed as well as the seasonal fluctuations in the food requirements and grazing habits of animals.

A more extensive and a better knowledge of the abovementioned aspects can also lead to the explanation of the disappearance of some species from certain areas, and why other species remain limited to a certain area, or do not multiply proportionally with the other members of the community.

Research to find answers to the above questions, is considered to be a long term project and data are continually added. It is also noted to which plants animals give particular preference during the different seasons. It has been impossible so far to give much attention to other aspects such as the normal daily requirements of the different animals, and the comparative quantities consumed or required by each.

Dr. H. P. van der Schijf, a former Assistant Biologist, recently published a list of plants which are eaten by mammals (Koedoe No. 2, 1959). The list has been checked and added to by the biological section. A complete list of the plants eaten by the larger and some of the smaller mammals is given below. This list will be enlarged annually. Unless otherwise stated, this list is based on direct observations.

## LIST OF PLANTS EATEN BY VARIOUS TYPES OF MAMMALS

### MONKEYS AND BABOONS

*[Cercopithecus aethiops cloetei* (Roberts) and *Papio (Chaeropithecus) ursinus orientalis* (Goldblatt)]

| Name of Plant | Common name | Part eaten | Date observed |
|---|---|---|---|
| *Annona chrysophylla* | Wild custard apple | Fruit | |
| *Acacia tortilis* | Umbrella thorn | Pods, gum and seed | |
| *A. nigrescens* | Knobthorn | Flowers | |
| *Antidesma venosum* | Voëlsit | Fruit | |
| *Adansonia digitata* | Baobab | Fruit | |
| *Balanites maughamii* | Torch wood | Fruit | |
| *Celtis kraussiana* | White stinkwood | Fruit | |
| *Cassia petersiana* | Dwarf cassia | Pods | |
| *Chrysophyllum magalismontanum* | Wild plum | Fruit | |
| *Carissa bispinosa* | Num-num | Fruit | |
| *Cassine schlechteri* | Lowveld cassine | Fruit | |
| *Cucumis metuliferus* | Wild cucumber | Fruit | 1.5.58 |
| *Conopharyngia elegans* | — | Fruit | 24.8.58 |
| *Diospyros mespiliformis* | Transvaal Ebony | Fruit | |
| *Dolichos taubertii* | — | Roots | |
| *Euclea* spp. | Gwarri | Fruit | |
| *Erythrina lysistemon (caffra)* | Kaffirboom | Bark (baboons) | |
| *Ehretia amoena* | — | Fruit (baboons) | 27.11.58 |
| *Ficus* spp. | Wild fig species | Fruit | |
| *Fagara humilis* | Lowveld Lemon Thorn | Fruit (baboons) | Feb. 1958 |
| *Grewia kwebensis*<br>*G. bicolor* | Raisin Bush species | Fruit (baboons) | 13.12.57 |
| *Hyphaene crinata* | Ilala palm | Fruit | |
| *Hexalobus glabrescens* | Shakama plum | Fruit | |
| *Kigelia pinnata* | Sausage tree | Fruit | |
| *Kraussia schlechteri* | — | Fruit | |
| *Lannea discolor*<br>*L. kirkii*<br>*L. edulis* | Bakhout<br>Baster Marula<br>— | Fruit | |

| Name of Plant | Common name | Part eaten | Date observed |
|---|---|---|---|
| *Lantana salvifolia* | Cherry Pie | Fruit | |
| *Mimusops zeyheri* | Moepel | Fruit | |
| *Nymphea capensis* / *N. petersiana* | Water lillies | Roots and thickened stems | |
| *Nicotiana glauca* | Wild tobacco | Juicy pith of stems (baboons) | 20.11.58 |
| *Parinari mobola* | Mobola plum | Fruit | |
| *Phoenix reclinata* | Wild date palm | Fruit | |
| *Pseudocadia zambesiaca* | Nyala tree | Fruit | |
| *Pappea capensis* | Wild plum | Fruit | |
| *Piliostigma thonningii* | Rhodesian bauhinia | Seed coat | |
| *Phyllogeiton discolor* | Wild almond | Fruit | Feb.-April '58 |
| *Pterocarpus angolensis* | Kiaat | Fruit | May-June '58 |
| *Phragmites communis* | Reeds | Tips of young plants peeled like sugar cane and eaten | 20.4.58 |
| *Rhamnus zeyheri* | Red ivory | Fruit | |
| *Rhoicissus capensis* | — | Fruit | |
| *Royena schlechteri* | — | Fruit | |
| *Salix woodi* | Natal willow | Flowers (Vervet monkey) | |
| *Schotia brachypetala* | Tree Fuchia | Nectar in flowers | |
| *Sclerocarya caffra* | Marula | Fruit | |
| *Strychnos innocua* / *S. spinosa* | Monkey orange | Fruit | |
| *Sterculia murex* | Lowveld chesnut | Fruit | |
| *Syzygium cordatum* | Water berry | Fruit | |
| *S. guineense* | Water pear | | |
| *Vangueria infausta* | Wild medlar | Fruit | |
| *Ximenia* spp. | Sour plum spp. | Fruit | |
| Young grass sprouts | — | — | Spring |
| Young steenbuck, duiker, bushbuck and impala are sometimes killed | Baboons | Mostly entrails | |
| Fresh water mussels | | | |
| Mopani worms | | | |

## PORCUPINE

*[Hystrix africae-australis africae-australis* (Peters)].

| Name of Plant | Common name | Part eaten | Date observed |
|---|---|---|---|
| *Adenium multiflorum* ... | Winter Impala lily ... ... | Tubers | |
| *A. swazicum* ... ... ... ... | Summer Impala lily ... | Tubers | |
| *Annona chrysophylla* . | Wild custard apple ... | Fruit | |
| *Adenia spinosa* ... ... ... | Kaasboompie | Roots | 12.9.58 |
| *Aloe* spp. ... ... ... ... ... | Aloe varieties | | |
| *Balanites maughamii* ... | Torch wood ... ... ... ... | Bark | 10.9.58 |
| *Combretum microphyllum* ... ... ... ... ... ... | Flame creeper ... ... .. | Roots | |
| *Commiphora glandulosa*<br>*C. betschuanica*<br>*C. calciicola*<br>*C. pyracanthoides* | Corkwood species ... ... | Roots | |
| *Colophospermum mopane* ... ... ... ... ... ... | Mopane ... ... ... ... ... ... | Roots | |
| *Cyperus* spp. ... ... ... ... | Sedges ... ... ... ... ... ... | Rhizomes | 10.9.58 |
| *Commelina* spp. ... ... ... | — | Roots | 10.9.58 |
| *Dolichos taubertii* ... ... | — | Roots | |
| *Elephantorhiza elephantina* ... ... ... ... ... | Elandsboontjie ... ... ... | Roots | |
| *E. goetzei* ... ... ... ... .. | — | Roots | |
| *Ficus petersii* ... ... ... ... | Peter's wild fig ... ... ... | Roots | 29.5.58 |
| *Gladiolus* spp. ... ... ... | — | Bulbs | |
| *Imperata cylindrica* ... | Beady grass ... ... ... ... | Rhizomes | |
| *Kigelia pinnata* ... ... ... | Sausage tree ... ... ... ... | Fruit | |
| *Lapeyrousia* spp. ... ... | — | Bulbs | |
| *Parinari mobola* .. ... ... | Mobola plum ... ... ... ... | Fruit | |
| *Sclerocarya caffra* ... | Marula ... ... ... ... ... ... ... | Fruit | |
| *Strychnos innocua*<br>*S. spinosa* | Monkey oranges ... ... | Fruit | |
| *Sanseviera* sp. ... ... ... | — | Rhizomes | 10.9.58 |
| *Talinum caffrum* .. ... ... | — | Roots | |
| *Ziziphus mucronata* ... | Buffalo thorn ... ... ... ... | Fruit | |
| Bones of decayed carcases and ivory ... | | Carried into burrouws and knawed. | |