

at Ruiru, approximately 30 miles north-east of Nairobi Park. The eartag was intact and the leopard in good condition; it was released on 17th August in the Amboseli Reserve in southern Kenya.

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Some parasites of East African wild animals

It has been our custom during the last few years to keep a chart in our laboratory showing some of the parasites that we detect in blood smears and other preparations taken from wild animals. This "rogues' gallery" generally seems to interest visitors so we have thought it worthwhile to publish it both as a preliminary report and also to encourage the many people who kindly send us material from wild animals to continue to do so (see Figure 1).

Some of the parasites recorded here are well-known; others are recorded but rare and some are new records. It must be emphasized that the chart is not exhaustive; it merely records the parasites that we have found. A blank square does not necessarily mean that the parasite has never been recorded from the particular animal. Records of parasites from wild animals are widely scattered in the literature but good review articles exist for the Theileridae (Neitz, 1957) and the trypanosomes (Ashcroft, 1959).

Our interest in parasites of wild animals originally stemmed from a desire to know whether they were infectious for domestic animals. We have transmitted *Theileria* species from buffalo and eland to cattle (Barnett and Brocklesby, 1959 and Brocklesby, 1962); *Babesia* species from zebra to horses and donkeys (Dennig, 1965); *Babesia* species from a side-striped jackal to dogs (Dennig, 1965) and a *Babesia* species from a leopard to domestic cats.

The chart gives the common names of the wild animals; for scientific names reference should be made to Stewart and Stewart (1963). "Striped grass

mouse" refers to *Lemniscomys striatus* and "Giant Rat" is *Cricetomys gambianus*. The genet cat was *Genetta tigrina*.

The first column of parasites in the chart is marked "Piroplasms" and two organisms are recorded, one from a spotted hyaena and the other from a whitetailed mongoose (*Ichneumia albicauda*). These piroplasms were discovered in thin blood films and looked like *Theileria* species. However, since small *Babesia* (*Nuttallia*) species are so similar morphologically to *Theileria* species and are so difficult to distinguish when present in small numbers we have thought it prudent to leave the diagnosis open. In this connection it is perhaps pertinent to draw attention to the work of Tsur, Hadani and Pipano (1960) who, in their description of *Nuttallia dani*, have indicated that this group of piroplasms may be closely related to the Theileridae.

Another feature of the chart that deserves comment is the presence of two question marks. One of these refers to a parasite, discovered in kidney glomeruli of a reticulated giraffe, that we are not able to identify with any certainty. Since it has some resemblances to *Cytauxzoon* we have placed it as a doubtful record in that column. The second question mark concerns an organism that was morphologically like *Toxoplasma*: this was found in a mouse that was collected from the intestines of a snake. No attempt to isolate the parasite was made so we feel that it should be regarded as another doubtful record.

A few of these parasites have already been described elsewhere (Brocklesby, 1965; Brocklesby and Campbell, 1960; Brocklesby and Vidler, 1961 and 1963; Martin and Brocklesby, 1960). Full descriptions of several others will be published later.

In addition to the parasites recorded from mammals *Haemoproteus* species have been found in the white stork (*Ciconia ciconia*) and the red-backed shrike (*Lanius collurio*). A *Leucocytozoon* species was found in a blackcap (*Sylvia atricapilla*).

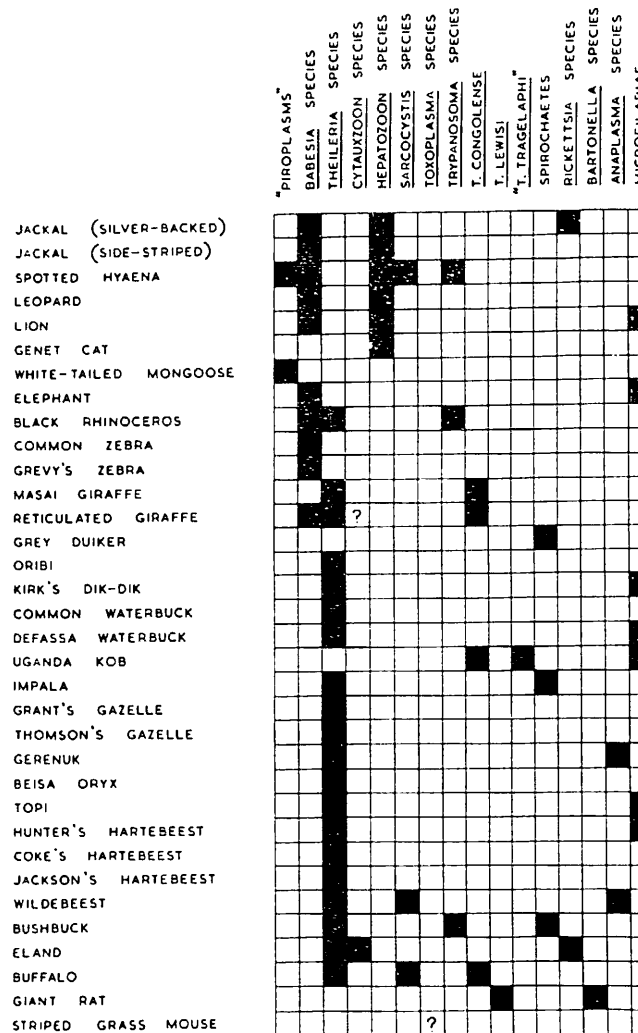


Figure 1
Chart of some parasites of wild animals.

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Observations on the behaviour of young spotted hyaena (*Crocuta crocuta*) in the burrow

Observations

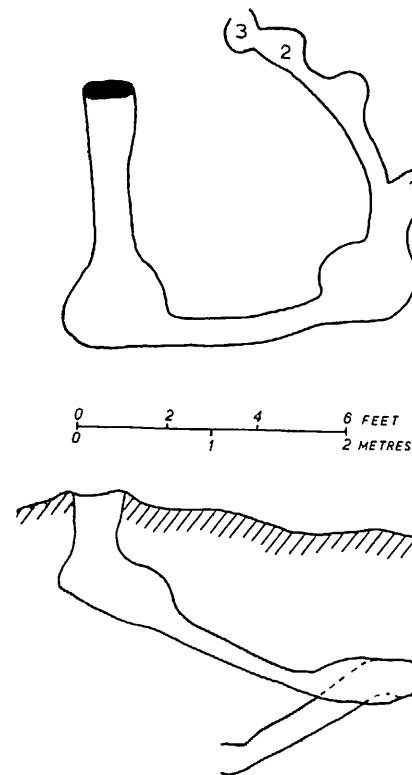
On the 12th November, 1964, an attempt was made at Banagi, in the Serengeti National Park, to dig out a young hyaena cub from its den so that this animal could be tamed and used by Dr. Kruuk in a hyaena study. Some aspects of the behaviour of the young animals in the den are so unusual as to be worth recording.

The den was approached just before 1800 hours whereupon a full-grown hyaena made off a short distance, and the young animals went into the den. Digging started at once and the main gallery was found to follow a rather square-sided lefthand descending spiral, as shown in the figure (see plan). The sharp bends in the tunnel were expanded into more or less spherical chambers. At a depth of about four feet the first hyaenas were encountered, lying in a small chamber to the side of the main gallery. One cub, estimated to be about two months old, was pulled out by hand, and showed little resistance. The back legs of a second cub of the same age were visible and an attempt was made to take this animal but considerable effort failed to remove it.

Further digging eventually showed that the head of this second cub was held firmly in the mouth of a three-quarters grown animal. After more than one hour of digging, during which falls of earth buried the hyaenas for short periods, the cub was extracted dead from the mouth of his older associate. The dead animal showed no external signs of injury, and had been alive during the early stages of the operation. It is suggested that the cub had been strangled by the other animal.

This three-quarters grown hyaena was carefully exposed until the whole head was visible, in which time no movements of life were shown, but the eyes were tightly closed. Only when a rope was put round its neck did the animal open one eye. It was dragged unwillingly from the burrow, by means of the rope, and released some distance away. It is of interest to note that inside the den no voluntary movements, apart from the opening of an eye, were seen and that outside the den the animal made several attempts to return, although the crater was now exposed and could offer little protection. Only after the animal was ten yards or so away did it make attempts to escape away from the centre of activity.

Digging continued and at a depth of five feet another two-month old animal was taken out dead. Once again no external signs of injury were seen, but the fur around the neck indicated that



Plan (above) and elevation of the hyaena den

The den was found in an old termite nest in the middle of a small, open plain surrounded by thorn thickets.

1. marks the place where the first two cubs were lying, with one 3/4-grown animal.
2. marks the third cub.
3. marks the fourth cub and the second 3/4-grown animal.

this animal might likewise have been strangled. Within three inches of the second dead hyaena cub a third two-month old cub was seen and confirmed to be alive. However, it was found once again to be held by the head in the vice-like grip of an almost full-grown animal. At this stage the operation was concluded, and the first cub was presented to Dr. H. Kruuk, of the Serengeti Research Project.

Discussion

The typical flight reactions of hyaenas seem dependent on age. Adult animals flee from the den; immature animals retreat into it. At this stage it is not easy to see the conditions in which it would be advantageous for adults to retreat from the den, and immature animals into it. Nor is the behaviour of the cubs observed in the den obviously adaptive, in the absence of any known predator entering the dens.

It must be added that Dr. Kruuk has since extracted hyaena cubs without experiencing this behaviour, although in these cases there have been no three-quarters-grown animals present.

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Pollination of the baobab (*Adansonia digitata* L.) by the lesser bush baby (*Galago crassicaudatus* E. Geoffroy).

Van der Pijl (1936), Jaeger (1945) and Harris and Baker (1960) have all reported observations of Fruit Bats (Megachiroptera) visiting the Baobab (*Adansonia digitata*). The latter two papers refer to the visits being made by the Straw-Coloured Fruit Bat, *Eidolon helvum* Kerr.

The Baobab in Kenya occurs in a belt covering the Eastern part of the country from the coast inland to an altitude of about 4000 ft. (Dale and Greenway, 1961). The large white pendulous flowers, up to five inches in diameter, open very rapidly at about 19.15 hours (16.15 hrs. GMT), some 15 minutes after