

# SOME ANCIENT AND RECENT OBSERVATIONS ON HYAENAS

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## INTRODUCTION

Professor R. A. Dart and the writer started the systematic collecting and sorting of bone fragments from the dumps at the Makapansgat Limeworks in 1948 in order to find out whether the bone deposits in the dolomite caves were, in the main, the work of carnivores, the hyaena in particular, as stated by Buckland (1822). Until finally disputed (Hughes 1954 Dart 1954) the hyaena was generally accepted by geologists and archaeologists as the primary source of such bone deposits.

A notable exception to Buckland's thesis, at the very outset, however, was brought to Professor Dart's notice, at the Third Pan African Congress in Prehistory, Livingstone, 1956, by Dr. L. H. Wells, now Professor of Anatomy in the University of Cape Town. The celebrated Dr. Robert Knox (1822) in contradistinction to Buckland, had had personal acquaintance with South Africa and its fauna through his journey thither in July 1817; he had returned to England on December 25, 1820. To Professor P. R. Kirby's (1940) valuable article on *Robert Knox and his South African Research* I am indebted for these dates and facts.

I propose here to point out in what ways our recent observations confirm those of Robert Knox and to set on record further data about what and how a hyaena eats, their reputed cannibalism, the similarity in the habits of brown hyaenas to other hyaenas in respect of failing to accumulate bones and the rôle of porcupines versus hyaenas in collecting bones and other hard objects.

Kirby (1940) also states, "At the end of 1822 Knox returned to Edinburgh from his studies in Paris under Cuvier, St. Hilaire, De Blainsville and Larrey, and within a few days he read to the Wernerian Society a *Notice relative to the Habits of the Hyaena of Southern Africa*. The paper resulted from the discovery, in a cave at Kirkdale in Yorkshire, of the bones of various animals which Dr. William Buckland, the eminent geologist, had stated must have been dragged there by hyaenas. Knox, drawing upon the knowledge which he had acquired in South Africa challenged Buckland's opinion immediately after its publication."

Unfortunately, owing to the opprobrium into which Knox fell through his association with the notorious Burke and Hare trials in Edinburgh (1828-29) his objections were apparently never followed up. His statements, however, agree so closely with my observations and those of well-known authorities on wild life today, that they warrant reproduction as *Africana*. In addition it is important at the same time to place on record the further observations, that have flowed from our following up the matter.

## 1. KNOX'S STATEMENTS AND MODERN CORROBORATIONS.

First Knox pointed out that hyaenas in the Southern peninsula of Africa "infest the whole country, attacking almost every animal but man". Statements have since been made of hyaenas attacking Natives in the veld at night, and even taking a Native from a hut in Nairobi itself. (Roosevelt & Heller, 1915). One of our medical graduates, Dr. D. Marais, states in a letter to the writer that a Bushman female was attacked during the day in Angola and killed by a hyaena. The truth of such incidents, and of how often in the past the attacks of packs of wild dogs may have been confused with those attributed to hyaenas, is difficult to ascertain. This much is certain, if such isolated occurrences attributed to hyaenas are fact such odd occurrences cannot be said to constitute a hyaena habit. The hyaena, an inherently curious scavenger, would undoubtedly receive a fright if, on inspecting a sleeping person, the individual awake or moved. The hyaena might also snap at such a moving object in self defence before dashing away.

Marais agrees with Knox in denying that hyaenas are cowardly animals. On the contrary he writes of a hyaena which was "shot by Dr. Uys Pienaar while it came charging straight towards him for about 100 yards across an open pan in Angola. He shot it at about 30 paces." He writes: "The ferocity of my tame hyaena is well known to you. No human being (except his few friends) will last three minutes if he enters his kennel." From my experience of wild hyaenas I have gleaned the impression rather of their cowardice; but this may be entirely due to their short, weak, hind legs and the resultant slinking appearance of the hyaena gait whether walking or running. In the Gemsbok Park I followed, during the early morning, two spotted hyaenas and a number of half grown pups on foot for some miles. These animals kept a respectable distance and showed no inclination either to attack me or to run away. In general wild animals do not attack man unless driven by hunger, or cornered, or defending their young.

Knox stated that hyaenas ". . . prefer, however, as being easier procured, the carcasses of animals which have either died of disease, or fallen under the hand of the huntsman. The carcass they often drag away to a considerable distance from the place where it fell; but I have almost always been able to discover the skeleton, and that often tolerably entire." This vitally important statement was corroborated (Hughes op. cit.) at the farm *Mala Mala* and has since been confirmed by observation in the Gemsbok Park during 1954 and later in 1956. Two, each almost complete, gemsbok skeletons were brought back to the Anatomy Department after the 1954 visit. These animals had been killed by lions and portions of them devoured by hyaenas and other carnivores. The skeletons show typical hyaena damage to the bones, but the skulls remain tolerably complete.

Knox continues: "Negative evidence, I am aware, is never reckoned so good as positive; and while I assert that the carcasses of animals killed at a distance from human habitations are generally devoured on the spot by the hyaena, vulture, etc., a fact proved by the bones being scattered about, and often confined to a small space, yet I do not wish it to be understood that I deny that hyaenas ever drag their prey, including the bones, to the caverns, or wild mountain-tracts, they inhabit. Many instances occurred, however, which indicate that they do not; and the most remarkable happened to me whilst surveying the exceedingly wild district bordering the Great Fish River and Caffraria. A large elephant had been killed about two months before, and had fallen in the centre of a forest of bush, infested with hyaenas, panthers and other beasts of prey. I proceeded to the spot, with a view of examining the grinding teeth, and was surprised to find almost the whole skeleton present, perfectly well cleaned, but almost untouched. It seemed to me that, had I been so inclined, I might have collected almost every bone, or at least a specimen of each, uninjured.

"Again, at a distance of many months, we used to visit the spots where large elephants, hippopotami, or buffaloes fell, and never failed to discover the remains of the skeletons, often exceedingly perfect. On the desert lay the skeletons of numerous antelopes, which had fallen a sacrifice to the lion and panther; and even close to the abode of man, the carcasses of sick oxen, sheep, horses, etc., are devoured by the hyaena, and the bones left within 100 yards of the inhabited buildings. In 1819 a dreadful drought devastated the country; the pastures were parched up, and the cattle died in vast numbers of hunger and thirst; now the carcasses lay within a few hundred yards of the farm-houses, and were there devoured by hyaenas; but never so far as I know, were they carried off. The animals which carry off their prey are the lion and panther, but not the hyaena or wild dog. I have, moreover, remarked, that the young of these animals follow them early into the field, so that I much question if they ever carry a portion of their prey, on any occasion whatever, to their dens. I may finally observe, that I have often roused the hyaena from his lurking place; but, assuredly these places bore no resemblance to charnel houses."

These notes by Knox (op. cit.) made nearly a century and a half ago embody a superb piece of accurate observation, which our information (Hughes op. cit. Dart op. cit. 1957) over the past four years substantiates.

## 2. WHAT AND HOW A HYAENA EATS.

During my visit with Mr. C. R. Brand to the Gemsbok National Park in 1954 two spotted hyaenas, that proved to be pregnant females, were shot by the warden and their stomach contents examined (Dart op. cit.). If fortu-

nately shot shortly after having devoured a beast the hyaena's stomach contents provide a satisfactory picture of its manner of engulfing food. With their strong teeth they rip out chunks of flesh and crack limb bones to swallow the pieces whole whatever the parts of "kills" which they themselves make or, preferably, may find after lions or other carnivores have finished their meal. The two spotted hyaenas shot in the Gemsbok Park had probably killed a springbok themselves because they had eaten the greater part of a pregnant ewe between them. The cat family generally eat the soft parts of a carcase; consequently other predators such as hyaenas, wild dogs, jackals, etc., are generally left with the tougher remainder. Canine teeth, and especially those of the hyaena, are, therefore, better adapted to the role of scavenger. The stomach contents of the two hyaena females were as follows:—

*Stomach No. 1* contained, in addition to hair and other soft tissues, the complete, 9-inch-long foetus of a springbok, pieces of gemsbok feet, a complete heart, stomach, kidney, tongue, ear and other soft parts of the springbok, 4 springbok hooves, the base of a springbok skull and a springbok horn fragment in addition to 68 bone fragments with flesh attached. (See *Fig. 1*)

*Stomach No. 2* contained the snout of a springbok, 39 pieces of bone with flesh attached, vertebrae, lungs and trachea, a complete ear, a fragment of upper jaw containing two teeth and a portion of the stomach of a springbok, in addition to a number of antelope bones that were too large to belong to a springbok.

All the bones and adherent flesh were in a fresh state, but despite the short time some of them had been in the stomachs of these two animals the sharp ends and edges of the cracked and swallowed bone fragments were already blunted by the action of the extremely powerful stomach acids. The skeleton of animal no. 2 is now mounted and in the Anatomy Museum of the Medical School.

### 3. WILL OTHER CARNIVORES EAT A HYAENA AND ARE HYAENAS CANNIBALS?

After examining and collecting the stomach contents of these two spotted hyaenas, one of the hyaena carcases was deliberately left on the east bank of the Auob River, where it had been killed, to see if any carnivore would eat it. After five days no carnivore had touched it, but it had been picked clean of flesh by vultures. Only the bones and dry skin were left. This observation corroborated the statement of Dr. Marais and his companions, that no carnivore, not even a hyaena, will eat a dead hyaena. He and his friends have often found their dried carcases on the veld.



Figure 1 — Some of the stomach contents of a female spotted hyaena shot in the Kalahari by Mr. Le Riche. Clearly seen in the centre of the picture is a complete foetal springbok. On the right are the undamaged heart, kidney, lung and trachea of an adult springbok. Hooves and bone fragments up to 4" by 2½" are shown on the left of the picture.

Mr. Mervyn Cowie, Warden of the Royal National Park of Kenya, however, writes: "Wild dogs . . . undoubtedly kill each other under certain circumstances, and then set about devouring the victim at once. With spotted hyaenas I have seen many willing to eat their own kind, but only after a dead one has become almost putrefied. In other words although I have seen spotted hyaenas killing each other, either in fighting for a lady or over a kill, I have never seen them eat each other until the dead one has been lying for something like four days, and has become what to us would be a most offensive object. On this theme I can quote from some very extensive personal experience, as it was my lot some 30 years ago to destroy in one zone alone well over 1,000 hyaenas by shooting, poisoning and in traps, and on no occasion did I find evidence of a spotted hyaena eating one of its own kind, even if it had been mutilated by vultures, until it had almost decomposed."

#### 4. THE UITKOMST ENQUIRY: ARE BROWN HYAENAS BONE ACCUMULATORS?

During 1955 Mr. C. K. Brain of the Transvaal Museum, Pretoria, investigated a cave on the farm *Uitkomst* at Gladysvale not far from the celebrated Sterkfontein site, and now owned by Mr. Jack Scott, the well-known director of gold mining companies in the Klerksdorp district near Johannesburg. This farm of approximately 10,000 acres, securely surrounded with about 22 miles of 7-foot-high, multi-stranded barbed-wire fencing, is kept as a private game reserve containing wildebeest, zebra, springbok, baboons, leopard, brown hyaena and other fauna.

The cave in question was known to be frequented by the brown hyaena and Mr. and Mrs. Brain had found in it 90 identifiable bones, of which 60 belonged to hares and rock rabbits as well as 128 bone flakes, and 395 hyaena droppings. This cave, which was also discovered on a later visit to exhibit signs of human occupation in the form of potsherds, had probably been used by the brown hyaena as a defaecating site and not as a lair. Learning subsequently that brown hyaenas inhabited the farm *Uitkomst*, I arranged with Brain to search the farm thoroughly; but we could not find any brown hyaena lairs containing bones. In all, during that visit in 1956, three hyaena and two porcupine lairs were inspected.

At *Mala Mala* on the western Kruger National Park border and in the Kalahari Gemsbok National Park both spotted and brown hyaenas are to be found; the spotted variety predominates, especially at *Mala Mala*. Yet two weeks devoted to thorough searching at *Mala Mala* with the assistance of two Natives over an area of approximately 100,000 acres failed to reveal to either Mr. N. F. H. Harington or myself a single lair containing bones. (Hughes op. cit.)

#### 5. THE GEMSBOK PARK ENQUIRY: HYAENAS AND PORCUPINES.

In the Gemsbok Park in 1956 the writer saw one night within one hour, three brown and one spotted hyaenas and several saddle-back jackals. Yet not a single hyaena lair containing bones belonging to either the brown or the spotted variety was to be found in the surrounding area although it was extensively searched.

During the visit to the Kalahari Gemsbok National Park in 1954, the writer examined with Mr. C. R. Brand and the Warden, Mr. J. Le Riche, no less than seven sites in the calcrete solution cavities of the Nossob and Auob River banks. Only two of these sites were holes in whose vicinity and interior bones had been collected; these were both porcupine lairs (Dart 1957) and were twelve and sixteen miles up the Auob River respectively. They contained gemsbok and springbok horns in addition to bones and pieces of wood

up to three feet in length as well as numerous porcupine quills. Most of these articles with the exception of the quills, were well gnawed by the incisor teeth of the porcupines. The remaining lairs and lie-outs found were absolutely clean and devoid of bones inside. A few bones and horns, cracked probably by hyaenas and left untouched by the porcupines and varying from two to eighteen in number, lay outside the holes in the calcrete. Hyaena faeces, mostly of pups but possibly including those of adults as well, lay not more than six feet away from some of these scattered bones. The following are extracts from my notes taken at the time relative to the individual sites:—

#### SITE 1

Spotted hyaena lair in the calcrete of the east bank of the Nossob river on St. John's Dam. *No bones in the lair.* Outside were some springbok hair from hyaena faeces, 2 pieces of springbok horn chewed by hyaenas (probably by pups).

According to Mr. Le Riche, hyaenas only frequent holes and caves to have their young. They sleep under trees and in the bush and grass or under overhangs on the river banks during the day, hunting or following lions by night. Brown hyaenas he said, do carry bones to the ground outside their holes; in pairs or more they will attack and kill domestic calves or springbok. They usually eat their kill on the spot; he asserts that he has seen as many as thirty-five brown hyaenas gathered at one spot in the Park.

#### SITE 2

Six miles up the Auob River in the calcrete of the east bank a number of holes occupied by spotted hyaenas with pups. *No bones in the lairs* and only a few broken horns and skulls with other bones outside. Hyaena faeces on the ground outside the holes, but these were largely of young animals. Total number of bones on ground outside holes: 4 springbok horns and 7 antelope bone fragments, 4 vertebrae of medium size, a piece of ulna, an innominate and a sacrum of small type — 18 in all.

#### SITE 3

Under an overhang on the east bank of the Auob River two spotted hyaenas were observed to be resting or sleeping. These animals were at first thought to be a pair but when shot and dissected were found to be two females. The ground under the overhang was *absolutely clean and devoid of bones or faeces.* This spot had been used as a lie-out for some time as indicated by the disturbance of the sand and the hollowed places where the hyaenas had been lying. Both animals were pregnant and were each carrying two foetuses. The stomach contents of these animals, which had had a large meal only a few hours previously, were examined, enumerated and kept (*vide supra*).

#### SITE 4

Eight miles up the east bank of the Auob River a hyaena lie-out. Clean and devoid of bones or faeces. From this site a number of porcupine droppings were collected.

#### SITE 5

Porcupine lair with bones. No evidence of hyaenas at all. This site was twelve miles north of Twee Rivieren in the east bank of the Auob River. Skeletal fragments and numerous porcupine quills were removed from this lair which also contained a large number of pieces of wood. Of the following 90 fragments only 23 or 25% escaped gnawing by porcupines: 1 meerkat skull, 4 antelope skulls (3 with their horns attached to them) 15 horns (5 gemsbok, 10 springbok) ox horns (no cattle in this area since 1932), 1 loose tooth, 11 vertebrae, 2 ribs, 27 limb bones, 17 bone flakes, 11 split bones of antelopes — 90 in all.

#### SITE 6

Porcupine lair. Sixteen miles up Auob river in the east bank. The dimensions of this lair were similar to those of the previous one. The entrance measured approximately 6 feet wide and the cavity penetrated 10 feet into the calcrete. From it branched a number of small tunnels, the maximum height in the whole area being two feet. Half the total number of bones present were removed owing to the difficulty in reaching the remainder. These comprised the following: 12 horns (5 gemsbok, 7 springbok), 2 skulls with horns attached (1 gemsbok, 1 wildebeest), 1 small palate, 1 medium sized mandible, 17 vertebrae, 2 ribs, 2 scapulae, 2 innominates, 13 long bones, 5 split bones — 57 in all.

Of these 57 skeletal parts only 13 or 21% were ungnawed by porcupines.

#### SITE 7

Hyaena-occupied antbear hole. The brown hyaena left the hole as we approached it. It had been living in the entrance which was in the river bed, probably to keep cool during the heat of the day. *This hole was clean and contained no bones.*

During the 1954 visit to the Gemsbok Park many antelope skeletons in greater or lesser states of disintegration were observed lying on the veld. Lion and hyaenas were seen near our camp at Twee Rivieren. In 1956 the writer twice traversed within the limits of the Park the length of both the Auob and Nossob Rivers for 230 miles; but our party of 17 individuals saw few skeletons. What, during the intervening two years, had become of the skeletons seen in 1954? Porcupines are the only likely collectors of dry bones! According to the Warden, Mr. Le Riche, and his Rangers, Mr. van der Westhuizen and Mr. Jacobs, the explanation had been a fire to the north in Bechuanaland and large numbers of animals had migrated from the Park



in that direction for the young grass, with the result there had been less indiscriminate killing by carnivores, and the occasional "kill" in the Park had been completely devoured by the remaining scavengers leaving little in the way of skeletal material behind.

For example, at Kasper's Draai, about 64 miles north of Twee Rivieren, an old gemsbok male had been killed by lions at the borehole the night before we camped at the site. The carcass had been dragged by hyaenas some 50 to 100 yards and apparently completely eaten, save for the skull (complete) and left portions of the mandible and its teeth. Thorough examination over a radius of 100 yards around the kill site disclosed in the tall grass and bush, 7 further bone flakes, 4 pieces of rib and a right scapula. All that remained of that kill, which had been finished off by a number of hyaenas, as could be judged by the trampled grass where they had fed during the night before, had been these 14 pieces, each hyaena finally taking a piece of the carcass some distance away from his fellow to consume it in relative peace. Many such bone fragments left on the veld are eventually dragged by porcupines near to and into their lairs. Had the Gemsbok Park veld been cleared of skeletons by the porcupines?

During these two visits the calcrete banks of both rivers were examined for hyaena lairs. The only lairs in which bones were found were porcupine lairs. These facts corroborate our previous conclusion that the hyaena, whether striped, spotted or brown, may be confidently eliminated as an agent for the collecting of large quantities of bones in lairs and caves; but the porcupine is an ardent collector of bones and is only superseded in that rôle by primitive man himself.

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#### BIBLIOGRAPHY.

- Buckland, Rv. W. Phil.: *Trans. Roy. Soc. Lond.*, 112, Part I (1822) p. 171-237.
- Dart, R. A.: "The Second or adult female mandible of *Australopithecus Prometheus*." *American Journal of Physical Anthropology*, N.S. 12: 313-44, 1954.
- Dart, R. A.: "The Osteodontokeratic Culture of *Australopithecus Prometheus*." *Transvaal Museum Memoir No. 10: 1957*. Published by the Transvaal Museum, Pretoria.
- Hughes, A. R.: "Hyaenas versus *Australopithecines* as agents of bone accumulation." *American Journal of Physical Anthropology* N.S. Vol. 12, No. 4, 1954.
- Kirby, P. R.: "Robert Knox and his South African Research." *South African Medical Journal* Vol. 14: No. 13: 1940.
- Knox, R.: "Notice relative to the habits of the hyaena in Southern Africa." *Transactions of the Wernerian Natural History Society, Edinburgh*, Vol. 4: p. 383: 1822.
- Roosevelt, T. and Heller, E.: *Life Histories of African Game Animals*. 2 Vols., London, 1915.