THE PREDATORY BABOON

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Harassed by other male baboons, Carl retreats to a tree branch to consume a small dikkid.

Between September 1970 and October 1971, I made a field study of a troop of freeranging olive baboons near the village of Gilgil in Kenya. I spent the first three months surveying baboon populations in the area, selecting one troop for a detailed study, and getting that troop accustomed to my presence. In the last eleven months, I spent over one thousand hours observing these animals from as little as ten yards away. I had two objectives: to correlate the way in which the baboons used their range with differing ecological conditions, and to collect information on the behavior of adult male baboons.

The troop I studied, one of at least seven living in an area of about 17 square miles, spent their days ranging across the parallel valleys of a large cattle ranch on the floor of the Rift Valley. These valleys, separated by tall cliffs up to 300 feet high, were mostly open grassland, interspersed with patches of scrubby bush and stands of a large crown-sprouting shrub called leleshwa.

There have been humans in this part of Kenya for a long time: near the ranch, the Acheulian handaxes of Middle Pleistocene man have been found in quantity at Kariandusi, a site originally excavated by the late Dr. L. S. B. Leakey. More recently, twentieth-century man and his domestic livestock have had a significant effect on the habitat. Predator control programs, undertaken to protect cattle, have presumably reduced the number of big cats in the area, although there are no records available to support this supposition. Lions are only occasional visitors, and leopards have been trapped periodically for removal to national parks, although they were known to exist in the baboons' home range.

Another major change has been the introduction of water in cattle troughs throughout the ranch. Finally, large areas of leleshwa scrub have been cleared to make room for grassland.

These alterations in the habitat apparently have also caused local populations of hoofed animals to expand. Thomson's gazelle, which prefer open habitat and are capable of lambing twice a year, have greatly increased their numbers over the past fifteen years, keeping pace with the range-clearing program. The reduced number of predators may also have contributed to the increase in antelope; at any rate, at the time of this study scientists from Texas A. & M. University estimated that 2,000 Thomson's gazelles and 800 impala lived in the area which the baboon study troop used as its home range. Although human intervention in the recent past changed some crucial aspects of the Gilgil baboons' habitat, at the same time they were relatively free from human harassment, since the country on all sides was used for raising cattle and there were few human crops to serve as a point of conflict with local people. In addition, trapping of baboons for medical research, which has put heavy pressure on baboon populations elsewhere in Kenya, was not permitted on the ranch.

During the course of my study I saw baboons in my study troop catch, kill, and eat an unusual number of small animals. This report will describe these events, compare them with similar behavior observed in other nonhuman primates, and discuss their implications for the origins of hunting in the Hominidae, the family that includes man and his immediate ancestors.

At the outset it is important to understand that baboons, whatever their carnivorous propensities, subsist primarily on vegetable matter. My study of adult male baboons shows that these animals spent about 80% of their feeding time procuring and eating grass seeds, blades and roots, 18% on fruits, seeds, and
1. A grassy valley at Kekopey Ranch, in the Rift Valley of Kenya, typical habitat of the olive baboon.

2. Baboons retreat to cliffs such as these at night, to sleep huddled in rocky niches.

3. Male Thomson’s gazelle in a territorial dispute. Infants of this species of antelope were a favorite baboon prey.

4. The klipspringer, a small antelope with hooves like hard rubber which enable it to live in the non-vertical habitat of rocky cliffs, much like the chamois. Klipspringers young were also taken by baboons.

_flowers, and only 2% on sources of animal protein, including beetles and other invertebrates. Nonetheless, I saw the baboons of the study troop kill and eat 47 small animals in just over 1,000 hours of observation, a predation rate far higher than has been reported for any other group of nonhuman primates. The chimpanzees studied by Dr. Jane van Lawick- Goodall and her associates at the Gombe National Park in Tanzania have killed and eaten more than 65 small animals, but these observations stretch over a decade.

At Gilgil, the preferred prey of the baboons was newborn Thomson’s gazelle infants. Sixteen of these animals were killed and eaten, and small antelope in general, including dikdik, impala, steinbok and others, made up two-thirds of the baboons’ prey. Twelve Cape hares, one button quail, and three small mammals I could not identify constituted the remaining third.

There was some evidence that local learned tradition played a role in the selection of prey animals, since the baboons of the study troop did not try to catch and kill every small animal of a suitable size, and nearby troops were seen to eat entirely different prey animals. Rock hyrax, a small, furry animal looking rather like a badger, lived on most of the cliffs where the baboons went to sleep at night, and, although baboons and hyrax encountered each other regularly, I never saw a baboon try to catch a hyrax. Subsequent observers in Gilgil have evidence that other troops in the area may prey on hyrax, and elsewhere in East Africa this behavior has been reported as well.

Flocks of helmeted guinea fowl were frequently seen wandering through the baboon troop as it ate eating grass, and, although guinea fowl were often within easy reach of the baboons, they were always ignored. However, another large troop of baboons, whose home range overlapped that of the study troop, caught and ate guinea fowl on several occasions. It is thus clear that different troops have different notions as to what kind of animal is good to eat. Adult female baboons were seen to catch only three of the forty-seven small animals which the troop killed, and on two of these three occasions the female was chased by an adult male and dropped her prey before she could eat it. The third female was also chased by a male, but her pursuer was distracted when she dropped part of her kill, and she was able to hide behind a bush and finish the rest.

The newborn antelopes, hares and other animals that the baboons killed and ate were all animals that defend themselves against predators by remaining immobile, using available cover to conceal themselves. It is not surprising, therefore, that most kills were made by chance, when a male baboon tripped over a crouching hare, for instance. In one typical example, I saw the baboons move in to feed in a grassy field which had been vacated
by a herd of Thomson’s gazelles some fifteen minutes earlier. Shortly thereafter, a small newborn gazelle struggled to its feet from its hiding place in the long grass and wandered off. Its small tail twitching. An adult male baboon promptly seized and killed the gazelle.

Yet, killings were not always fortuitous; several times I watched male baboons leave the troop as it made its way across an open field, move over to a herd of grazing antelope, and begin to walk a cross-cross pattern through the herd, eyes directed at the grass on either side. The male baboons also made similar excursions away from the troop into brushy areas, typical habitat of the dikdik, a tiny, fox-terrier-sized antelope. Both types of behavior appeared to be conscious efforts to look for suitable prey, and each resulted in a kill on occasion. Although the male baboons often took up the chase of a prey animal already being pursued by another baboon, there was no indication that the monkeys were cooperating with each other by doing so.

Once the prey animal had been caught, the baboons made no deliberate attempts to kill before beginning to eat it, just as many carnivores do not kill their prey right away but begin to eat it as soon as it is under their control. In the case of newborn antelope, the baboons usually began by eating the soft underside of the animal, and death quickly followed. Smaller animals, such as the button quail, virtually disappeared in a mouthful, but young antelope were carefully eaten. The baboons tore off chunks of meat by gripping the flesh with their front teeth, grasping their prey with two or more limbs, and pulling back their heads. A baboon often stripped the skin from an antelope limb with its front teeth, but in general the meat was torn from the inside of the skin and no attempt was made to skin it before eating it. I examined almost every kill site carefully after the baboons had finished eating and found that very little had been left uneaten; usually only scraps of skin or an occasional long bone remained. As a final morsel, the baboons plucked the skull with their teeth and consumed the brain of their prey.

Once a prey animal had been captured, others of its species usually did little except to stand at a distance and watch it being eaten; however, several times female antelope were seen trying to rescue their young. On one of these occasions a female impala successfully defended her infant, apparently unable to get to its feet, from repeated attacks from at least two adult male baboons. In the course of chas-

ing the baboons to their sleeping cliffs she managed to incite other impala herds in the same valley, first an all-male herd of fifteen animals and then a "harem" herd of one male and twenty-three females, with the result that

impala began to chase baboons in all directions and the baboon troop soon left the area.

As already mentioned, adult female, juvenile and infant baboons were virtually excluded from meat-eating during the year I spent in Gilgil. There was an unequal distribution of meat among the adult males as well, however. Adult male Carl, who was the largest and most influential animal in the troop, caught and ate eighteen small animals, almost twice the number caught by the next most accomplished male, Sumner, who caught ten. Males Radcliffe, Alger and Moses caught five, three, and two animals respectively, while three were caught by females and six by males I could not identify at the time. These figures are deceptive, however, since Carl was able to add considerably to the amount of meat he ate by confiscating animals killed by other baboons immediately after they had been taken. Carl obtained an additional nine animals this way, making him the prime meat consumer of the troop, with twenty-seven animals eaten, or 57% of those caught. No other baboon came close to Carl in this regard, and Moses, at the other end of the scale, was forced to give up his two captures to Carl and finished with no animals to his credit. However, Moses, like other males, was often able to acquire some meat by being the first to grab the carcass after the original eater had abandoned it, and in this way he was still able to get more meat than any female.

I never saw a baboon share meat voluntarily with any other baboon, unless leaving the carcass on the ground when satiated can be called a form of sharing. On the contrary, a kill generally caused aggression levels in the troop to rise markedly. The most common reaction of the males to a kill by one of their number was to sit like a vulture within five yards of the meat-eater and stare at him, occasionally threatening him and any other males nearby. While relative status in the troop sometimes appeared to determine which baboon got most of a prey animal, this was not always the case. For instance, adult male Carl was often seen waiting a male of lower status eat meat without any overt attempt to deprive him of it. In a similar incident, Radcliffe was able to drive Carl from the carcass of an infant gazelle, even though at the time Radcliffe was wounded and had become the least influential male in the troop. Thus, male status was not always a reliable predictor of behavior around a kill.

Baboons passed up carrion and ate meat only when either they or another baboon of the same troop had recently killed the prey animal. Thus the study troop ignored the carcass of a steinbok that had died less than 24 hours earlier, although several baboons passed within a yard of it during a troop movement.
1 A female impala charges male baboon Carl (right) in a vain attempt to rescue her infant which he holds in his teeth.

2 Unable to save her infant, the mother impala and two younger antelopes watch the small antelope being eaten.

3 Adult male baboon Carl, who killed and ate more small animals than any other baboon in his troop during 1970-71.

4 Adult male Carl, yawning as the tension around an antelope kill rises. displays the long razor-sharp canine teeth which are a male baboon's most formidable weapons.
increased movement should have resulted in more chance discovery and killing of small animals. It did not. Finally, there were three occasions when the baboons seemed to kill several animals in a short period, but there were not enough examples of this clustering in time to make a useful case. However, the fact that baboons kill and eat small animals in the wild has been known for some time. The South African steenbok, said Dart, and the Damaraland fennec, has been described by many.Tvlwawood's knowledge of baboon behavior in the wild is not limited to the capture of small animals. Dart has compiled a record of references in the early literature to the predatory habits of baboons, and it is clear that they are carnivorous where food is scarce. In South Africa, the baboons with incidents in which baboons were seen to kill wild game, Dart's purpose is to put all of this information into a coherent form. "That predatory behavior in a large terrestrial primate other than man was natural and adapted to the environment is not in conflict with the insectivorous origin and diet of primates." If baboons could be shown to have a "perpetual" and "instinctive need" for a meat diet, and to feed on larger animals, as D'Aubenton did, they, too, could be said to have some meat in their diet. In the first ten years of the research, the chimpanzees that frequented the Van Lawick-Goodall research station in the Gombe Stream National Park, Tanzania, 65 animals were known to have been killed by baboons and another 37 unsuccessful predatory attempts recorded. 65% of the prey animals were other primates, such as baboon infants, red colobus, blue monkey, red-eared monkey, red aotus, and bushbaby and guinea pig accounted for the remainder. Japanese observers in Uganda have also seen chimpanzees eating meat. In the early 1960s, a notable example was theUniversity of Cambridge Press. Dart, Raymond A. 1963 "Cannibalistic Propensities of Baboons," Symposia of the Zoological Society of London. 30: 43-56. 1971. African Genesis. New York: Athornum. Harding, Robert S. G. 1973 "Predation by a Troop of Olive Baboons (Papio anubis) in the African Journal of Physical Anthropology. 38: 307-312."