

Basarwa Ambush Hunting in Botswana

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The diverse hunting strategies employed by the Kalahari Basarwa (Bushmen) have been described by Lee¹, Tanaka², Silberbauer³, Marshall⁴, and elsewhere. These strategies include the tracking and pursuit of large game, the capture of burrowing animals by various methods, and the use of snares and other traps for obtaining small mammals and birds. Information is now available on another hunting method practised by the Basarwa and Bakgalagadi of Botswana, that of ambush hunting for a wide range of species; this hunting method is carried out from hunting blinds concealed near pans, river pools, game trails, and salt licks. The long-standing use of this hunting procedure is attested in early travellers' and hunters' accounts, but it has been overlooked by recent authors. Livingstone⁵, for example, referred to what he termed the 'Bushman-like practice' of ambushing ostriches and other game at water holes in the Makgadikgadi Pans, and Hodson⁶ mentioned the use by Bakgalagadi hunters of blinds built near salt licks at King Pan, east of Khakhea. This paper summarizes information on the contemporary practice of ambush hunting which was collected by the authors in 1976; it is based on interviews with a total of twelve Basarwa hunters from two localities in Botswana. Four informants were from the !Kung (Zu/ǀasi) settlements of Dobe and !Kubi in western Ngamiland, and eight were /Kaiǀwa Basarwa from the villages of Man/otai, Segoro, and Tsaitsumtsaa along the Nata River north-east of Nata Village. Supplementary interview data were obtained from approximately 80 other hunters. Additional research efforts included the mapping of most of the ambush hunting locations used by our informants (to record blind, game trail, and kill locations), the description, measurement, and photographing of a number of extant blinds, and the excavation of a sample of ethnographically recorded hunting blinds.

Ambush hunting in the Dobe area

Dobe is the name of a small permanent water hole and !Kung settlement located in the north-western Kalahari Desert, about 140 kilometres west of the Ngamiland village of Nakaneng. The vegetation of the area has been classified generally as 'North-west tree savannah'.⁷ This environment does not support large herds of game at the present time, although there is some evidence of a larger and more varied game population in the past.⁸ Kudu (*Tragelaphus strepsiceros*), gemsbok (*Oryx gazella*), and blue wildebeest (*Connochaetes taurinus*) were present in 1975/76 and occurred as solitary or in small groups of almost always less than ten animals, with no species in the area exceeding a maximum of 25-30 individuals in a herd. Smaller mammals in the area include duiker (*Sylvicapra grimmia*), steenbok (*Raphicerus campestris*), porcupine (*Hystrix africaeaustralis*), springhare (*Pedetes capensis*), and a number of other species. Roan antelope (*Hippotragus equinus*), buffalo (*Syncerus caffer*), zebra (*Equus burchellii*), giraffe (*Giraffa camelopardis*), and elephant (*Loxodonta africana*) are seen during and after the rains, when surface water is available in the north-western Kalahari.

During the course of archaeological excavations at #Gi,⁹ a small seasonal pan six kilometres south of Dobe, the presence of a number of circular stone structures near the pan was noted. These structures were distributed around the pan margin and were in most cases adjacent to game trails which lead from the bush to the edge of the pan (Fig. 1). We learned from interviewing several local !Kung hunters that these structures had been used as blinds

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for ambush hunting of kudu, duiker, roan, wildebeest and probably other species which come to the pan at night to drink or to eat saline earth which occurs in several deposits at the edge of the pan basin. Several of the 16 known blinds at #Gi Pan had been built and used as recently as about 1970; others were of unknown antiquity. We also learned of other nearby locations where stone blinds had been built and used within the last ten years; these places included !Kubi Pan, !Xabe Pan, /ai/ai Pan, and a salt lick named Gui/o. Shallow pit blinds had been used by two informants in about 1960 for hunting roan and kudu at !Gausha and !Gausha-ma pans, located 12 kilometres north of Dobe. It seemed important to record this aspect of the fast-disappearing aboriginal culture of the !Kung, and we were stimulated to collect as much information as possible in the time available on ambush hunting strategy, the construction and placement of blinds, seasonality of blind use, and other details. We were later able to obtain comparative data from Basarwa hunters in the Nata River area, where Hitchcock was conducting ethnographic and archaeological research.

!Kung blind construction

Hunting blinds were built in the morning or afternoon before the night when a hunt was planned, with the labour shared among the men who would be occupying them. At #Gi, loose blocks of the calccrete which is exposed around the edges of the pan were collected and laid down in one to three courses to construct circular walls which averaged 1.5 metres in interior diameter and ranged from 10 to 65 centimetres in height. Enough stones could be collected from within an area 20 to 30 metres in diameter to construct one blind. Most blinds were placed in such a way as to take advantage of nearby bushes and trees for additional concealment, and six of the blinds had tree trunks or bushes incorporated into their walls. Pit blinds built at !Gausha and !Gausha-ma pans were 20 to 30 centimetres deep and about two metres in diameter, and had to be dug in relatively hard ground with digging sticks. Brush and grass were then collected to build a low screen (50-60 cm high) around the pits. Unlike at #Gi and !Kubi there are no rocks at these pans, and in general, blinds appear to have been built with whatever materials were immediately at hand.

Once a blind was completed, a fire was built inside it, either in a small pit in the centre of the blind or against one wall. This fire was allowed to burn down to coals and then was carefully banked to eliminate flame and smoke; the embers would remain hot through the night, to be uncovered when the hunters wished to light pipes or warm their hands. The total time required for building a blind and fire was two to three hours in the case of stone blinds, and probably longer for pit blinds, when a digging stick was the only excavating tool available. It was not always necessary to build new blinds; especially in the case of stone blinds, the structures were relatively permanent and were re-used whenever possible. The builder(s) of a blind was considered its owner to the extent that others wishing to use it were expected to seek his permission.

!Kung ambush hunting strategy

Ambush hunting from blinds in the Dobe area was often a cooperative effort in which up to six hunters would be deployed in several blinds around the margins of a pan. It was undertaken successfully in several cases by a single hunter, however, and the mean number of participants per night in the Dobe interview sample was 2.7. The mean number of blinds occupied per night was 1.6. Hunts took place only when moonlight provided sufficient visibility to allow accurate shooting. The bow and poison-tipped arrow was the primary weapon employed, although spears were kept in the blinds for killing wounded game and for protection from attacks by lions and hyenas. (See Fig. 2 for a !Kung man's interpretation of ambush hunting). Several animals might be wounded with arrows during the night, and all

would be tracked the following morning, with the hope that the poison would have taken effect and killed or severely handicapped the wounded animals.

Blinds were placed so that the game trails, along which animals were expected to move toward the pan, were upwind of the blind(s) occupied by the hunters. This prediction was based on inspection of the game trails for fresh spoor; apparently animals present in the region of a pan would tend to use the same trails from night to night. Figure 1, which shows the locations of most of the 16 known blinds at #Gi Pan, reveals two apparently different strategies of blind placement in relation to game trails, water, and saline earth deposits. Ambush hunting was practised at #Gi only during the dry months in which surface water dwindles to small 'wells' at the bottom of the pan basin (these are labelled 'dry season water holes' in the figure). Even these shallow depressions are usually dry by October or November if not earlier. Blind 10 was built within a few metres of the northern well, and the blinds numbered 2, 3, and 16 were also built out on the open margin of the pan, close to both the southern well and the saline earth deposits. The advantage of this placement strategy would seem to be that animals emerging from the vegetation surrounding the pan on any number of game trails upwind from the occupied blind(s) would converge at the wells or salt patches where they could be shot. The alternative strategy seems to have been to build the blinds back in the vegetation, adjacent to specific trails where game was expected to pass. This locational strategy placed a greater importance on successfully predicting which trails would be used, but at the same time permitted greater concealment of the blinds. Game might also be expected to be less wary when moving through the bush than when exposed to view on the open pan margin. These blinds may also have been used sooner after the end of the rains, when water filled more of the pan basin.

Seasonality of blind hunting in the Dobe area

Ambush hunting by the Dobe area !Kung was confined to the two dry seasons: *!gum*, the winter dry season (May to late August), and *!ga*, the hot, dry weather before the rains (late August to November). The majority of the blinds discovered in the Dobe area are located at two large pans (#Gi and !Gausha) where water is available to game for several weeks up to a few months after the ends of the rains, longer than at any of the smaller and more ephemeral pans scattered through the veld. #Gi Pan may hold throughout the dry season if the rains are heavy, as it did in 1975. (It should be noted that game cannot drink at the several permanent wells in the area, as these are fenced to control access by cattle). A few blinds were found near smaller, earlier-drying pans, including !Gausha-ma, where informant Do-1 once killed a kudu from a blind soon after the rains had ended. It thus seems that ambush hunting commenced early in *!gum* and continued as long as water remained in the larger pans. Informant Do-3 stated that ambush hunting at #Gi Pan was done in both *!gum* and *!ga*, but that hunting there was not practical as long as animals could drink everywhere at small pans scattered throughout the region.

Drinking behaviour of species hunted from blinds

The dry season concentration of game around water points implied by this informant's statement is difficult to understand, because, of the four species presently known to have been hunted from blinds in the Dobe area (kudu, duiker, wildebeest, and roan antelope), only roan are dependent on surface water. Kudu, duiker, and wildebeest are able to obtain all necessary moisture from grass, browse, bulbs, or melons.¹⁰ Kudu, however, will drink standing water if it is available,¹¹ as will wildebeest.¹² The presence of water at pans like #Gi and !Gausha might well result in local concentrations of these animals when other surface

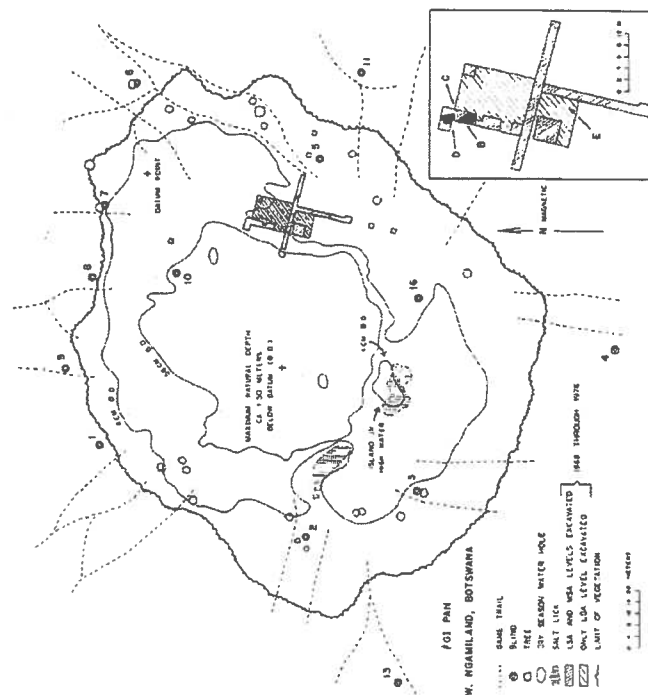


Fig. 1 Map of #Gi Pan showing locations of hunting blinds, game trails, archaeological excavations, and water level.

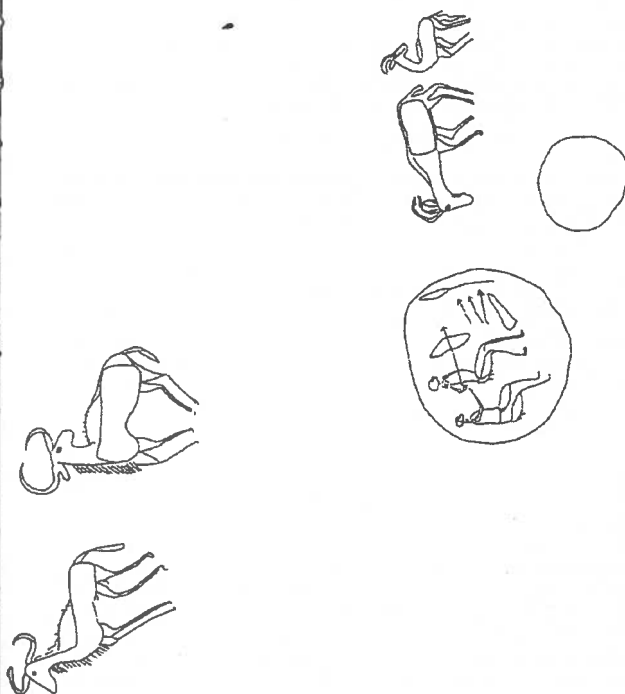


Fig. 2 Drawing by a Moserwa (Ikung) artist of ambush hunting from a blind at a Gi Pan. Two hunters, equipped with bows, extra arrows, and a spear-thrower, wait in a blind next to a dry season water hole. The animals depicted in the lower right are roon antelope; those in the upper left are wildebeest.

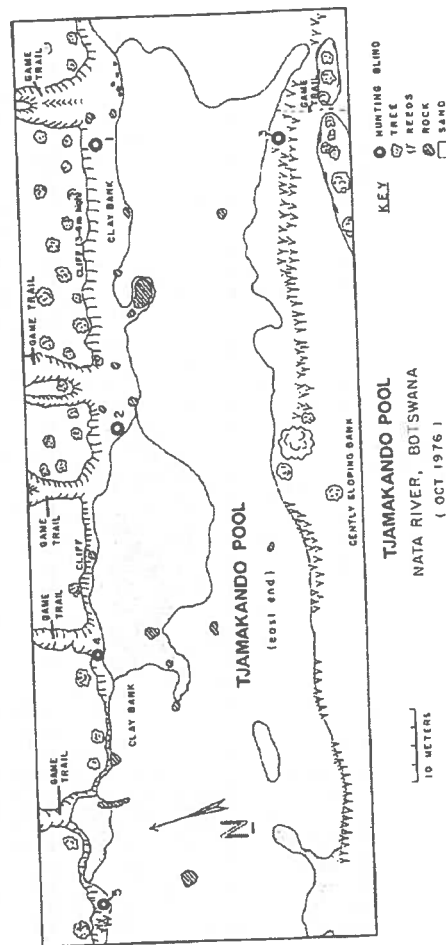


Fig. 3 Sketch map of Tjamakando Pool, Nata River, showing locations of hunting blinds and game trails.

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water has dried up. This would not be true for duiker, however, which were never observed drinking water during a three-year study by Wilson.¹³ There seems to be no problem in explaining the presence of roan at the pans as they are known to be water-dependent,¹⁴ moving west into the Dobe area from the Okavango Delta during the rains and remaining only as long as surface water is available.

The presence of saline earth deposits around pan margins, or a high dissolved mineral salt content in the water, may be additional features of the pans which attract game. Consumption of salty earth, or of the highly mineralized water found in some Kalahari pans and river pools, is common among desert antelopes in Botswana, and is probably necessary to counterbalance deficiencies of calcium, phosphorous, and other elements in their intake of vegetable food.¹⁵ Mineral salt deposits can be found at *!Gai* Pan, primarily in the form of white stains on the surface of the ground when it is dry. We commonly observed cattle licking or eating these same deposits. There are, in addition, several waterless salt licks near *!Gai* which attract game, including *Gul'o*, where a kudu in the act of licking the ground was killed from a blind by informant KU-I. *!Gai* itself may attract game even late in *!ga*, during years when its surface water dries up completely because of the salt deposits present there. It should be pointed out, however, that all ambush hunting at *!Gai* for which interview information is available took place while water was still present in the pan.

Dobe ambush hunting seasonality: a summary of the evidence

There is clearly insufficient information as yet which can be used satisfactorily in relating aspects of animal behaviour to the restriction of *!Kung* ambush hunting to the dry seasons. Rainy season ambush hunting for kudu and wildebeest was practised by Basarwa hunters in the Nata River region in north-eastern Botswana, suggesting that the seasonality of ambush hunting has its basis within the whole complex of choices which comprise the overall subsistence strategy of each Basarwa group. Concentrations of game around late-drying pans may occur, increasing the probability of hunting success, and resulting in a better return from the investment of labour time and energy that ambush hunting requires. The mobile or pursuit hunting of large game is minimally productive during the dry months of July through September,¹⁶ and the mobility of *!Kung* bands is also restricted during these months by the dwindling supply of surface water. Ambush hunting at pans near dry season camps may formerly have provided the easiest method of obtaining large game during that time of year.

Ambush hunting in the Nata River area

The second group of hunters included in the study were from the Chiredam and Goredam-speaking Basarwa populations, found along the middle third of the Nata River in north-eastern Botswana.¹⁷ Environmental degradation in the Nata-Nekati region, brought about by severe overgrazing, has resulted in extensive bush encroachment in the formerly open grassy plains away from the wooded banks of the river.¹⁸ The Nata River flows during most rainy seasons, but during the dry months surface water contracts to a series of shallow pools in the sandy bed of the river. Prior to a serious decline in population between 1960 and 1965,¹⁹ large herds of wildebeest watered at these pools in the dry season and would later move into the Makgadikgadi pans region; a similar pattern of movement out of the Lake Xau area in the south-western portion of the Makgadikgadi Pan complex was noted by Child.²⁰ These movements comprised a regular annual pattern of migration, although during severe droughts, which were often accompanied by failure of moisture-providing plants, early massing in the dry season range would result. Interviews with the Nata River Basarwa revealed that this species, formerly of great importance to their diet and one which was easily hunted from blinds at the river pools, has not been seen in any numbers at the river since

about 1964. By 1962 things had deteriorated to the point where people could walk up to emaciated animals within a few hundred metres of Nata Village and dispatch them with clubs, spears and knives.²¹ Cape buffalo were also commonly hunted from blinds at the pools though, unlike wildebeest, dry season herds usually numbered less than ten animals. The Nata River is believed to be the easternmost extent of the range of this species in Botswana, presumably because buffalo are water-dependent and require well-wooded areas for cover.²² Kudu were also killed occasionally from blinds along the river.

Ambush hunting at river pools was a common strategy, and accurate information about this practice was relatively easy to obtain because kill locations could be visited. Large herds of wildebeest, or buffalo in groups of up to ten individuals, would descend game trails worn into the steep banks of the river and approach the water to drink. The hunters, deployed around the margins of the pool in chest-deep, log-roofed pits or behind reed screens, would wait until all the animals in a herd had arrived, and they would choose the fattest ones as targets. Most animals were shot while they were in the water, at ranges averaging ten metres. The most common weapons used were muzzle-loading guns or Martini-Henry rifles sold or loaned to the Basarwa by Ngwato and Kalanga cattle owners in the area. One man told us of killing wildebeest at Tsaitsumtsaa Pool with a spear from a type of brush blind which allowed him to stand and throw without revealing himself to the animals. Several old informants remembered that this method was used before guns were available, and that in the past several hunters working together might kill wildebeest by surprising the animals from blinds and trapping them up against a high river bank where they could be speared. Bows and arrows were never used. The blinds had to be rebuilt every year because they were destroyed by the water that filled the river bed during the rainy season. Unlike the Dobe area, there are no extant blinds along the Nata, so exact descriptions of blind construction could not be obtained. Figure 3 shows the locations of game trails and blinds at the east end of Tjamakando Pool, the pool which forms the southern end of the study area along the middle third of the Nata River. It can be seen that blinds were placed close to the game trails, and as close to the water as possible, to allow a flat angle of fire.

Careful concealment of the pit blinds (which were covered with layers of grass and sand), and the large number of animals which crowded into the narrow river bed, permitted shooting of selected animals from very close range; most animals wounded this way died almost immediately. The Nata River Basarwa who used guns had a distinct advantage over the *!Kung* at Dobe, since they were saved the labour of tracking wounded animals and the uncertainty of recovering them.

Although limited in seasonal duration, ambush hunting at the Nata River appears to have been a highly productive means of obtaining meat. In addition to a higher meat yield per man-night of hunting than at Dobe (discussed in detail below), there are other indications to support this contention. Several informants said that meat was obtained in sufficient quantities to make it an item of trade with the Kalanga people to the east. Dried wildebeest and buffalo meat was bartered along with salt obtained from Sua Pan, baskets, palm fronds, and other items for bullets, gunpowder, dagga, and tobacco. The large numbers of animals, and the regularity of their nightly visits, made it a near certainty that a night's hunting would be rewarded. Once a hunter and his partner had killed an animal and protected it from predators by placing thorn branches over the carcass, they would leave it unbutchered and return to the village to sleep. This practice was in contrast to the *!Kung*, who remained all night in their blinds in order to wound as many animals as possible. Perhaps such all-night vigils were not considered necessary on the Nata River, because there was less uncertainty of obtaining more meat another night.

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Productivity of ambush hunting

Both the ecological contexts and the strategies of ambush hunting were quite different in the two areas studied. In the north-western Kalahari, large herds of game are no longer present. Ambush hunting done in the recent past at !Gausha, and other pans by the !Kung was a means of obtaining antelope such as kudu, roan, wildebeest, and duiker when they arrived singly or in small groups to obtain water or mineralized earth. Once the hunters had wounded the prey with their poisoned arrows, the necessity of tracking them the next morning remained, and recovery was by no means certain. On the Nata River, the annual dry season congregation of wildebeest and buffalo herds at pools along the river assured the Basarwa that large quantities of game would be available for hunting from blinds. The availability of guns made the killing and recovery of the prey more certain.

We attempted to assess the effects of these different conditions on the productivity of ambush hunting in the two areas; this was done in terms of edible meat obtained per man-night of hunting. Our method was to ask each of our 12 informants to attempt to reconstruct the events which occurred during specific hunting episodes, including the number of hunters present and the number and species of the animals killed during each hunt. In most cases we were able to learn the sex and age (adult or immature) of the animals killed, making possible a more accurate estimate of the amount of meat yielded by each kill. Additional information collected included the number and placement of blinds, weapons used, success in marksmanship, amount of time spent in tracking, and the recovery rate of wounded animals.

Table 1 lists the sources from which estimates of mean live weights of the five species killed from blinds in our sample were derived. Preference was given to published weight series with the largest sample sizes and the closest possible geographical proximity to Botswana. Immature animals were estimated as having one half of adult mean weight. The estimated usable meat yield (45% of live weight for all species) is the standard estimate employed by Botswana's Department of Wildlife, National Parks, and Tourism.

Interviews were conducted with four Dobe area hunters, who described a total of 18 nights of hunting in which they and others had participated. At Nata we interviewed eight hunters about 25 nights of hunting. The unit employed in the productivity analysis was the man-night of hunting, which means the occupation of a hunting blind for one night by a single individual. The number of men present during each night's hunting was summed for all the nights recalled by an informant, in order to give the total number of man-nights with data for a particular location. For example, informant Do-1 (Dobe sample) described four nights of hunting at !Gausha Pan, once when he hunted alone, and three nights when he was joined by three other men. This gave a total of 13 man-nights with data for !Gausha Pan. Informants could almost always recall what the other men they were hunting with had killed, but in no case was it possible to cross-check accounts of the same night's hunting. When an informant said that he had hunted with other men, but could not clearly recall what they had killed, only the informant's own kills were counted, and the number of man-nights with data was calculated only for him. Tables 2a and 2b list the data obtained for each interview sample.

Results of productivity analysis

Based on these admittedly limited data, it appears that productivity was about four times as great for dry season ambush hunting at Nata River pools (61 kg per man-night) as it was for dry season pan hunting in the Dobe area (15 kg per man-night). This difference can be attributed to three factors: the larger size of the animals commonly killed at Nata (buffalo and wildebeest) compared to the duiker, kudu and roan killed at Dobe; the lower success rates of marksmanship; and the lower recovery rate of wounded animals at Dobe. The in-

TABLE 1

Mean live weights and estimated usable meat yield of 5 species killed from hunting blinds (in kg).					Published Reference	Location	Range (kg)	Mean Live Weight (X)	Sample Size (N)	Sex
Species	1. Duiker (<i>Sylvicapra grimmia</i>)	2. Roan (<i>Alcelaphus busiatus</i>)	3. Kudu (<i>Tragelaphus streptoceros</i>)	4. Buffalo (<i>Syncerus caffer</i>)						
	♂	♂	♂	♂	Smithers (1971)	Botswana	15.3 - 21.2	18.6	24	♂
	♀	♀	♀	♀	Smithers (1971)	Botswana	17.1 - 25.4	20.6	37	♀
	♂	♂	♂	♂	Wilson (1968) ^a	Zambia	242 - 298	280	12	♂
	♀	♀	♀	♀	Wilson (1968)	Zambia	225 - 284	261	15	♀
	♂	♂	♂	♂	Wilson (1968)	Zambia	189 - 295	258	45	♂
	♀	♀	♀	♀	Wilson (1968)	Zambia	150 - 209	171	43	♀
	♂	♂	♂	♂	Wilson (1968)	Zambia	473 - 811	620	54	♂
	♀	♀	♀	♀	Wilson (1968)	Zambia	386 - 601	460	60	♀
	♂	♂	♂	♂	Hitchins (1960) ²	S. Africa	178 - 294	239	33	♂
	♀	♀	♀	♀	Hitchins (1960)	S. Africa	142 - 217	190	22	♀

^aWeights for pregnant and non-pregnant females have been combined.

In cases where sex information was not obtained, ♂ and ♀ means have been averaged to obtain the estimated mean yield.

Duiker (no sex) = 8.5-kg yield
Wildebeest (no sex) = 97 kg yield

TABLE 2a

Meat obtained by blind hunting, Dobe sample				No. of man nights
Sample size Nights w/	Man-nights	Animals	Est. usable meat per animal (kg)	
			Est. usable meat obtained per	

TABLE 2a

Meat obtained by blind hunting, Dobe sample

Informant	Location	Sample size Nights w/ data	Men-nights w/data	Animals obtained	Est. usable meat per animal (kg) (see Table 1)	Est. usable meat ob- tained (kg)	Est. usable meat ob- tained per man-night	No. of men nights meat obtained
Do-1	iGaukha Pan	4	13	2 FA roan 1 MI roan	117 63	234 63	23	12
						Sub-total 297		
	iGaucha-ma Pan	6	9	1 MA kudu	116	116	13	2
Ku-1	Gul'o (sali lick)	3	6	1 FA kudu	77	77	13	2
	oOl Pan	2	11	3 FA duiker 1 MA duiker 2 ? duiker 1 MA kudu	9 8 17 116	27 8 17 116	15	11
						Sub-total 168		
Do-2	/al/al Pan	1	5	0	0	0	0	0
	iXabi Pan	1	2	1 FA kudu 1 FA duiker	77 9	77 9	43	2
						Sub-total 86		
Do-3	oOl Pan	1	3	0	0	0	0	0
Totals:		18	49	2 FA roan 1 MI roan 2 MA kudu 2 FA kudu 4 FA duiker 1 MA duiker 2 ? duiker 14 animals		744 kg	*	29

*Mean kg of meat per man-night of hunting = 774 kg ÷ 49 man-nights = 15 kg.

TABLE 2b

Meat obtained by blind hunting, Dobe sample

Informant	Location	Sample size Nights w/ data	Men-nights w/data	Animals obtained	Est. usable meat per animal (kg) (see Table 1)	Est. usable meat ob- tained (kg)	Est. usable meat ob- tained per man-night	No. of men nights meat obtained
SG-2	Tjamakando Pool (Nata River)	5	13	1 MA wb 1 FA wb 2 ? wb 2 FA buf	108 86 97 207	108 86 194 414	62	13
						Sub-total 802		
MIN-15	Dogore Pool (Nata River)	2	4	2 ? wb	97	194	48	2
SG-1	Tjajjagmasaa Pool (Nata River)	2	2	2 MA wb	108	216	108	2
SG-4	"	1	1	1 MA wb	108	108	108	1
MIN-5	"	5	5	1 MA wb 1 FA wb	108 86	108 86	39	2
						Sub-total 194		
T-5	"	1	2	1 FA wb	86	86	43	2
S-1	"	4	4	1 MA wb 1 MI buf	108 139	108 139	62	2
						Sub-total 247		
SG-3	Chihubu Pool (Nata River)	3	6	1 FA wb 1 FA kudu 1 MA buf	86 77 279	86 77 279	74	6
						Sub-total 442		
Totals:	Tjamakando Pool	25	41	2 MA wb 1 MI buf 8 MA wb 4 FA wb 4 ? wb 1 MA buf 2 FA buf 1 FA kudu	108 86 279 279 47 108 207	216 86 279 279 47 108 207	54	4
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fluence of the first factor on the higher productivity of blind hunting at Nata is clearly expressed by comparing the estimated amount of edible meat yielded per kill there (199 kg) with the 53 kilograms per kill obtained by the Dobe hunters. The large sizes of the drinking herds of buffalo and wildebeest which congregated at the Nata pools gave hunters there an additional advantage. It was mentioned earlier that informants told us of waiting until the entire herd had come down to drink before choosing the specific targets to shoot. At Dobe an attempt was made to shoot all animals (except hyaenas) which came within range of a blind. A known bias introduced by the small size of the sample is that one large species (wildebeest), which is known to have been hunted from blinds at #Gi Pan (Fig. 2), was not killed during any of the hunts for which systematic interview data were obtained. There is, however, no evidence that this species was present in the Dobe area in large numbers within the last 20 years, so these animals must have been killed only occasionally from blinds there.

The other factors contributing to a higher productivity for blind hunting at Nata were that: (a) all animals shot at there were hit and killed; and (b) all were recovered, whereas at !Kung hunters hit only 16 out of 24 animals (for a marksmanship rate of 66%) and failed to recover two of the wounded animals. The mean range of successful shots for the Dobe sample was 26 metres, compared to a mean of 10 metres at Nata. The longer ranges from which the !Kung hunters had to shoot at their targets resulted from the open nature of the pan margins at #Gi and !Gausa. The large number of game trails radiating out in all directions from the water led to greater difficulty in predicting the place where game would appear. Along the Nata, buffalo and wildebeest herds had either to move up the river bed on their way to water, or to descend the steep slopes to the pools on a limited number of game trails. The large number of prey arriving at one time made blind placement a less critical factor at Nata than at Dobe. The massing of animals in the river bed also made spear hunting practical; three of the wildebeest in the Nata sample were killed with thrown spears by informants MN-5 and S-1. It seems unlikely that this method could have been used successfully at Dobe.

Of the 15 animals shot with muzzle-loaders at Nata, all but one died immediately. This was a wildebeest shot in the leg which required two days of tracking time. Neither the three animals shot at Nata with rifles nor the three killed with spears required any tracking time, and the recovery rate was 100 percent. Two duiker wounded at #Gi Pan were not recovered, one because its tracks could not be followed on stony ground and the other because it was eaten by hyaenas. This means that the !Kung hunters in our sample recovered 14 of the 16 animals wounded (88%). Yellen²³ believes that the average recovery rate for animals shot with poisoned arrows by the !Kung during mobile (pursuit) hunting is closer to 50 percent; the higher rate in the case of ambush hunting may have been due to sampling error or it may reflect better arrow placement and the quicker death of wounded animals because of a shorter shooting range permitted by ambush hunting. It should be noted that the mean number of man-days spent tracking wounded animals in the Dobe sample was 1.5.

Hunting success ratio was defined as the total number of man-nights in each sample when at least one member of a hunting party killed and recovered an animal, divided by the total number of man-nights for each sample. This ratio was equal to 0.83 (34/41 man-nights) for the Nata sample, and 0.59 (29/49 man-nights) for the Dobe sample. The difference in overall success rate is the combined result of differences in shooting accuracy and in the percentage of wounded animals recovered in each sample.

Conclusions

This comparison of the success of ambush hunting as practised by two Basarwa groups, in two rather different ecological contexts, was based entirely on interview data. The analysis must therefore inevitably reflect some inaccuracies of recall on the part of our informants, as

well as errors introduced by the small size of the interview sample. Nevertheless, it seems reasonable to conclude that real differences in the technique and productivity of ambush hunting exist under varying ecological conditions. These differences stem from ecological factors such as the drinking behaviour, body weights, and herd sizes of hunted species, as well as the topography and vegetation of the hunting sites. The technological factor of weapon-type employed — bow, spear, or gun — also affected productivity, the amount of labour time involved in tracking wounded game, and the type of blind constructed. How important was ambush hunting to the overall subsistence economies of hunting peoples in the Kalahari and other regions of Africa? What other variations of this method have been used, and under what ecological conditions? Have hunting blinds been preserved in the archaeological record? To what extent is ambush hunting still practised? We hope to address these and other questions in future reports.

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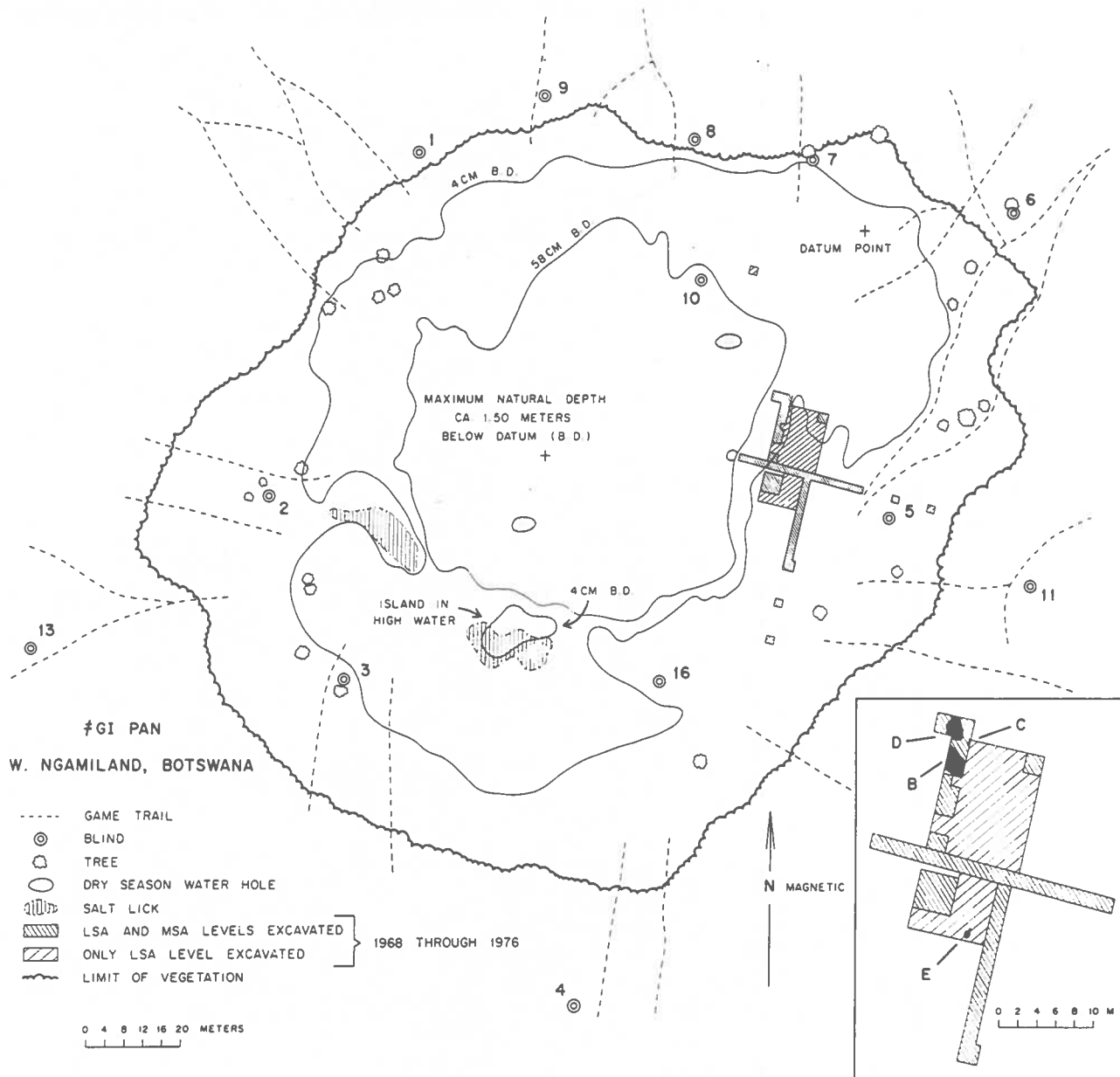


Fig. 1 Map of #Gi Pan showing locations of hunting blinds, game trails, archaeological excavations, and water levels.



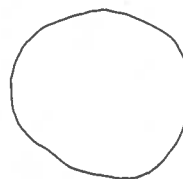
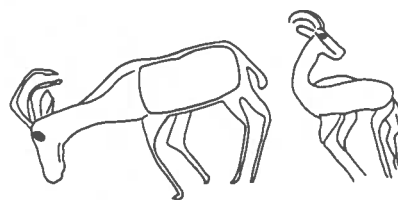
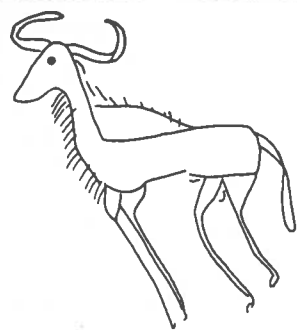


Fig. 2 Drawing by a Mosarwa (!Kung) artist of ambush hunting from a blind at #Gi Pan. Two hunters, equipped with bows, extra arrows, and a spear wait in a blind next to a dry season water hole. The animals depicted in the lower right are roan antelope; those in the upper left are wildebeest.

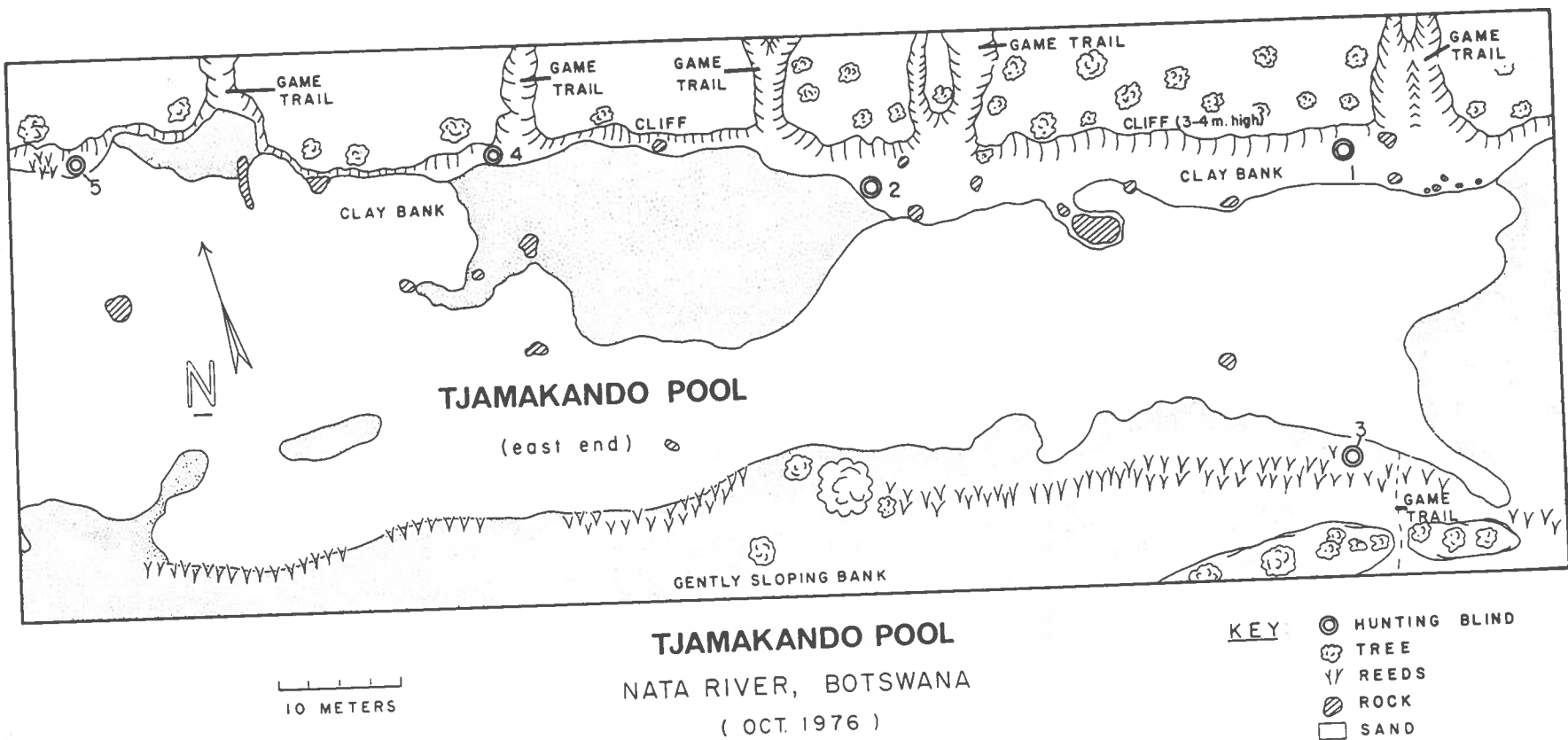


Fig 3 Sketch map of Tjamakando Pool, Nata River, showing locations of hunting blinds and game trails.

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