

Deer in New Guinea.

PART I: NOTES ON THE FIELD IDENTIFICATION OF CERTAIN DEER SPECIES LIKELY TO BE ENCOUNTERED IN PAPUA AND NEW GUINEA.

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ABSTRACT.

The presence of two species of deer, the rusa (Cervus timorensis) and axis (Axis axis) have been confirmed in the Territory of Papua and New Guinea.

The more useful observations which can be made when deer are seen are listed, and the signs made by deer in the bush are described.

The points by which the two Territory species of deer may be identified when seen in the field are listed and compared with four other species, which, although not recorded in the Territory, may have been introduced.

INTRODUCTION.

Of the species of deer detailed in the following notes, only two, rusa (*Cervus timorensis*) and axis deer (*Axis axis*) are known to be established in the Territory of Papua and New Guinea (Downes 1968). Details of four others, fallow deer (*Dama dama*), sambar (*C. unicolor*), red deer (*C. elaphus*), and the sika deer (*C. nippon*), are included for comparison. Although there is no evidence to support it, they were probably introduced to the Territory at the time acclimatization of the other species took place.

It is reasonable to assume that many characteristics of both appearance and behaviour of the deer in the Territory will be no different from those of the same species in their native habitats. Because very little is known of their precise origin or how many varieties were imported, and because of the innate difficulty of identifying female deer at a distance, positive identifications will await the collection of adequate specimens. Sightings by any but the most experienced observers will be of doubtful value unless the animals can be studied at comparatively close quarters and adequate notes taken at the time of observation.

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However, it is important to record all sightings of deer, particularly in new country, and to notify the Wildlife Laboratory in the Department of Agriculture. If possible, skins, samples of hair, skulls with jawbones and antlers should be sent to the Laboratory.

These notes are intended for use by field officers of the Department of Agriculture, Stock and Fisheries, Territory of Papua and New Guinea. They are not an exhaustive key to the species. But much could be gained from chance observations of deer in the bush if the hunter knew what to look for. Detailed identification notes are provided in a number of books which should be used for the final identification of specimens. The available sources of information are listed under each species.

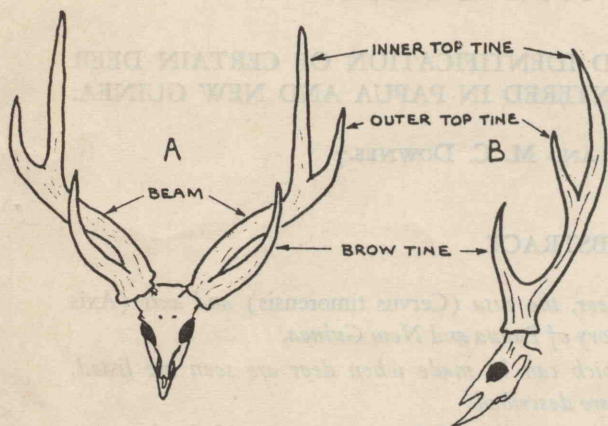
POINTS TO LOOK FOR.

The technique of deer-stalking can be developed by observing some basic requirements. Extremely slow movement, with frequent stops, is most likely to produce sightings since in a country which has any type of cover, the range of vision changes at every step. The animals should be approached from a downwind and, if possible, a downhill direction. Having the sun behind is also an advantage.

When deer are seen.

Note the shape of the antlers (*Figure 1*). Record the details of colour patches, etc.

ANTLERS



The antlers of mature stags in full, hard antler invariably will conform to diagrams A & B. viz: the INNER or longer top tine of the terminal fork will be a continuation of the beam. This characteristic may not be noticeable in stags of 3 years and younger.

Diagrams C & D show antlers in which the OUTER top tine is the longer and which is a continuation of the beam. If seen, these should be noted as should multi-tined or unusual antlers such as diagram E.

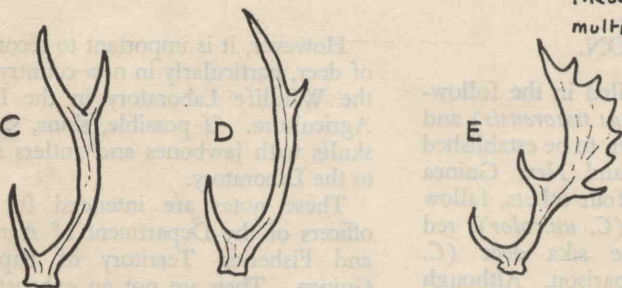


Figure 1.

Note the relative sizes and numbers of the different animals in the group.

Classify into stags, yearlings, hinds, calves (see 'Age Groups').

Fill in a Deer Sighting Report Sheet as in Appendix 1 and send to the Wildlife Laboratory, Department of Agriculture.

When deer are shot.

Note details of antlers, sex organs, foetus, etc.

Fill in a Deer Specimen Report Sheet as in Appendix 2.

Measure body size (Figure 2).

Collect the lower jawbones and some hair. For complete identification, the complete skull, the whole skin including the tail, hoofs and head are required.

Collect about $\frac{1}{2}$ lb. of food from the rumen and preserve in 10 per cent. formalin.

Label specimens and send with report to the Wildlife Laboratory, Department of Agriculture.

SIGNS COMMON TO ALL DEER HABITAT.

Hoofprints.

These are the signs which are the first thought of by most observers. Confusion can occur between well-formed tracks of goats and, say, fallow and other smaller kinds of deer. To a lesser extent the same can be said of the tracks of young cattle and red deer. Information on approximate track sizes is given in the following notes. The edges of clearings and native gardens, swamps, ridge saddles, trails used by other game, logging tracks and unfrequented foreshore, are the most likely places in which to find deer sign.

Rubbing trees.

All male deer use trees and shrubs for antler play, the removal of the velvet on the completion of antler growth, and for the marking of their territory. Rubbings can be seen from ground level to two or three feet above ground level. There is usually a centre of damage to the bark at a height of about two to three feet. A particular species of tree is frequently favoured, or isolated trees uncommon in the area. Stag territory is often marked by several rubbed saplings of one to three inches in diameter. These are easily seen because there are usually several examples visible from the one viewpoint.

Droppings.

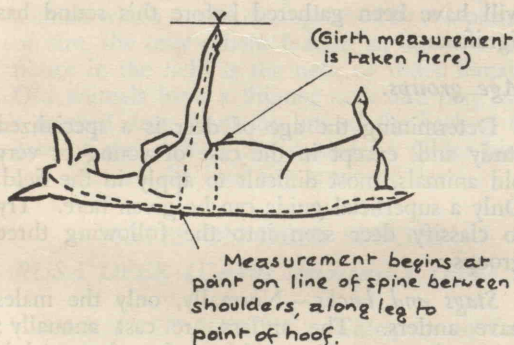
Usually deer faeces are in pellet form, similar to those of goats and sheep. The size varies with the size and species of animal. Spring growth or other lush feed can cause droppings to become similar to a small 'cow pad'. The droppings of

very young fawns are, on occasion, elongated and not unlike those of a young dog. Pellets are by no means a reliable factor in identification unless supported by other evidence. Pellets disintegrate rapidly when exposed to heavy rain, but if in a dry or sheltered location they remain recognizable for a much longer time.

Wallows and rutting scrapes or holes.

Sambar, red deer and rusa make wallows which the hinds also use. In country frequented by wild pigs their wallows can be distinguished by the droppings thereabout and the height of mud rubbings on nearby trees. In the case of deer the rubbings may be more than six feet above ground level. Rutting scrapes—holes of varying depth depending on soil type—are made by fallow deer and sika using forefeet and sometimes antlers. There is an odour about these holes which, in the case of the sika, is "strong, penetrating and musk-like" (Kiddie 1962).

HEIGHT at SHOULDER



TOTAL LENGTH



The line of measurement follows curves of dorsal surface from tip of nose along spine to last vertebra of tail.

LENGTH of REAR FOOT

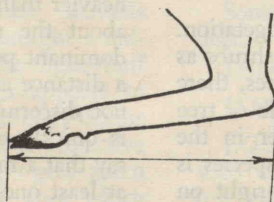


Figure 2.

There is usually an odour in most stag territories which becomes recognizable with experience.

Hair.

Samples of hair may be found on rubbing trees, caught in splinters or rough bark; where an animal has passed under a hanging tree or limb; in the mud of a wallow; in the wire about a garden or plantation, or in high grasses where there is an impression of an animal having lain down. In a situation similar to the last mentioned, a sample of hair can usually be taken by wetting the palm of the hand and pressing it firmly over the area; hair will readily stick to the palm. Skins or pieces of skin may be in the possession of villagers. Any samples of hair should be collected, taped to a white card, the particulars of location and date recorded, and sent to the wildlife laboratory for microscopic examination and identification. The collection of a series of such samples from as wide a distribution as possible is most important.

Cast antlers.

Many species of deer cast their antlers annually in Spring. Some Asiatic varieties are irregular and may cast them less frequently. Cast antlers are difficult to see in the bush and are seldom found except where there is a good concentration of animals. They become bleached and chewed away by rodents or the deer themselves, or if discoloured and lichen-covered, they are indistinguishable from fallen branches. Villagers finding them would possibly make knife handles or other articles from them, or they could be expected to hang them about their gardens or on the wall of a hut. This possible source of information could be borne in mind. If the antlers and jawbones can be easily obtained they should be preserved to dispatch to the wildlife laboratory.

Browse evidence.

Deer feed on a very wide range of vegetation. being browsers they use many trees and shrubs as well as grasses. Apart from rubbing trees, there are usually one or more varieties of shrub or tree which are particularly attractive to deer in the area. Heavy browsing on one or two species is usually noticeable. Deer will stand upright on the hind legs to reach favoured browse and lighter

branches may be broken down from a height of six to seven feet in the case of the larger deer. They will also eat many aquatic plants, mosses and lichens, fungi and seaweed.

Voice.

It is not possible to convey an accurate impression of the great variety of sounds made by deer. Some deer are more vocal than others but only a most experienced observer could identify a deer by this evidence alone. Most male deer are more vocal during the breeding season, or rut, as it is more usually termed. Any call closely or even vaguely resembling the bellow of domestic cattle is worth investigating. Stags will show varying degrees of interest in human imitations of their calls during the rut. In cover and unseen, hinds or does of several species will give an alarm bark, sometimes repeated. Females and young make very soft calls barely audible at 50 yards. Male deer also bark on occasion. Pre-eminent among the alarm barks is that of a surprised sambar stag which is startling and unforgettable at close quarters. Some species give a shrill whistle or scream. The rattle of stags' antlers when sparring playfully or when actually fighting is also a distinctive deer sound, but usually other evidence will have been gathered before this sound has significance.

Age groups.

Determining the age of deer is a specialized study and, except in the case of young or very old animals, most difficult to apply in the field. Only a superficial guide can be given here. Try to classify deer seen into the following three groups:—

Stags and bucks.—Normally, only the males have antlers. The antlers are cast annually; regrowth commences within a few days and is complete in about 16 weeks. Contrary to popular belief, the number of points on the antlers is not a reliable indication of age. The adult stag is heavier than accompanying hinds and this weight about the neck and shoulders coupled with a dominant posture makes the stag recognizable at a distance and in situations where the antlers are not discernible. This recognition of stag shape is quickly developed. To generalize, one could say that a mature stag would have antlers that are at least one-and-a-half to twice the length of the head.

Apart from the general impression of age, a salient feature to observe is the neck line of the undisturbed animal. As age increases, so the head is carried lower and the graceful curve of neck is lost. In a very old animal the neck line becomes practically a prolongation of the line of the back.

At close quarters, antler pedicles may be studied, and it will be noticed that the pedicles of older stags are short and the coronet or burr of the antler closer to the skull than that of a young animal. After a stag reaches maturity, its antlers are said to go back, i.e., lose length, weight and tines.

Yearlings.—At about eight months, the growth of the antler pedicles is noticeable. They appear as lumps on the skull and the growth of the first year antlers or spikes is a continuation of the pedicle development. It is most unusual for first year antlers to be anything more than simple spikes which will vary in length from two or three to fifteen inches according to the species of deer. A young looking stag with spikes would be in its second year. Except during the rut, male deer may be seen in groups.

Hinds and does.—Apart from very young animals which can be distinguished by comparison of size, the only salient feature an observer may notice in the field is the neck of older females. Old animals have a thinner neck and may have a marked drop from the line of the back to the base of the neck at the shoulder. Older hinds and does usually lead any group of deer.

NOTES ON DEER SPECIES.

RUSA DEER (Cervus timorensis) (Plate I).

SHOULDER HEIGHT. Thirty-six to forty inches.

WEIGHT. Average mature stag to about 220 lb. The hind perhaps to 40 lb. lighter.

COLOUR. Greyish-brown; some animals appear much darker (age?). In sunlight a reddish tinge is most noticeable. The light buff colour of the belly and inner legs appears to extend more generally into the darker body colour and provides a remarkably effective protective colour combination. There is a light-grey patch on the under-neck and throat to the chin which is prominent in good light.

EARS. Not strikingly large (6 in.) and inclined to be pointed.

TAIL. Appears thin and is not bushy.

HOOFPRINT. Rarely larger than $2\frac{3}{8}$ in. $\times$ $1\frac{1}{2}$ in.

HABITAT. Appears to be adaptable to a wide range of habitat. Tends to live in herds, and groups of several animals are often seen.

HAIR CHARACTERISTICS. (Neck and back.) Individual hairs flattened.

SIGHTING UNDER 50 YARDS. Often three or more animals. The neck appears long and craning and the head small in comparison with the body—particularly so with large-antlered stags. Stag groups may be seen. The antlers, when viewed from the front, are lyre shaped and have six tines. The top-most tine on each antler is vertical and these two tines, thrusting upward and carried upright are most prominent in the mature stag. During the rut, stags decorate their antlers with masses of vegetation. This decoration is not the accidental carrying of rubbing tree matter. Although a reddish tinge is sometimes quite noticeable in the body colour, this should not cause confusion with the red deer, because the rusa does not have a light-coloured patch on the back, above the tail. A retreating rusa does, however, display a prominent area of light colour under the tail, and between the back legs. The animal has a particularly rangy, 'leggy' look, and after the initial alarm may stand again at 100 or 200 yards' distance. These deer wallow. The stags fight savagely during the rut.

References.

BENTLEY (1967): 67-69.

RINEY (1955): 15-17 includes comparison with sambar.

VAN BEMMEL (1949).

AXIS DEER (Axis axis) (Plate II).

Sometimes referred to as chital or spotted deer.

SHOULDER HEIGHT. To 36 in.

WEIGHT. To about 200 lb.

COLOUR. Chestnut-brown, brightly spotted with white; dark stripe along spine evenly spotted white. White belly and throat. The white spots remain throughout the year.

(a)



(b)



(c)



(d)



Plate I: RUSA DEER.—(a) Rusa stag. Note the straight and vertical inner or rear tines of terminal fork. This head has not uniform structure in both antlers. (b) Rusa hind and fawn (four months old). Note long neck, light-coloured legs and patch at throat. (c) and (d) Rusa stag.

[Photographs are of specimens of deer from Australia, not New Guinea].



Plate II : AXIS DEER.—Axis stag.

[Photograph is of a specimen of deer from India, not New Guinea.]

EARS. Not noticeably large. Pointed.

TAIL. Long, with bold, white fringe.

HOOFPRINT. Rarely larger than 2 in. $\times$ $1\frac{1}{8}$ in.

HABITAT. Open forest at lower levels.

SIGHTING UNDER 50 YARDS. This deer has a strong herd instinct and except for lone stags, will usually be seen in groups; 50 animals or more if the country is quite undisturbed. Axis deer are among the most beautiful of deer, and are comparatively easily identified by their bright markings. The white throat is a striking characteristic. The antlers are usually six-tined (brow and terminal fork) and are quite slender. The velvet of the growing antlers is reddish-brown. The tail is raised on alarm and the white underside is most conspicuous, particularly when several animals move off. These deer do not wallow, but are not likely to be found far from water.

References.

BENTLEY (1967) : 63-66.

RINEY (1955) : 11-13.

FALLOW DEER (*Dama dama*) (Plate III).

SHOULDER HEIGHT. Thirty-four to thirty-six in.

WEIGHT. Buck to about 200 lb.; doe considerably less.

COLOUR. Usually light-brown or fawn, sometimes with a reddish tinge flecked with large white spots. This is the usual summer colouration but there are many variations; sometimes white or black animals are seen. The winter colour is grey or dark-brown without spots or

the spots barely discernible. A black, or very dark, line of hair runs along the spine to the tail. Underparts creamy-white. Young are spotted.

EARS. Five in. and pointed.

TAIL. Fairly long, often black, with fringe of long, white hairs. When animal is not alarmed the tail is flicked constantly.

HOOFPRINT. Rarely larger than $2\frac{1}{4}$ in. $\times$ $1\frac{1}{2}$ in.

HABITAT. Prefers lighter country at lower levels to mountainous forest. Adult buck has a most noticeable tuft of long hairs on the penis sheath.

SIGHTING UNDER 50 YARDS. Two or three animals or sometimes more, in open country, may be seen together. The palmated or flattened antlers of the adult male are a positive identification. The general glimpse of a grey-with-white, smallish animal (summer) is the usual sighting in bush. A single animal unsure of the danger will move off with a bounding, stiff-legged gait with the tail held over the back, all four feet off the ground together. In this situation, the animal will stop after about 50 yards to again locate or confirm danger. Fallow are not often vocal, but very occasionally they may bark once or twice if suddenly alarmed. During the rut the bucks give a throaty rattle but they do not roar. In open country, a group of fallow should be fairly easily seen, particularly if an adult buck is present. These deer do not wallow.

References.

BENTLEY (1967) : 54-61.

CADMAN (1966).

CHRISTIE AND ANDREWS (1966) : 82.

PAGE (1962).

PRIOR (1965).

RINEY (1955) : 20-22.

SAMBAR DEER (*Cervus unicolor*) (Plate IV).

SHOULDER HEIGHT. To 50 in.

WEIGHT. To 600 lb., but average adult stag 350 to 400 lb. Adult hind 250 to 300 lb.

COLOUR. Uniform dark shades of brown, almost black appearance in certain lights. Hinds frequently lighter in colour than the stags. Light buff colour on the belly, inner legs, buttocks and chin. Often an orange-coloured fringe of hair surrounds the light patch on the rump. The young are not spotted.

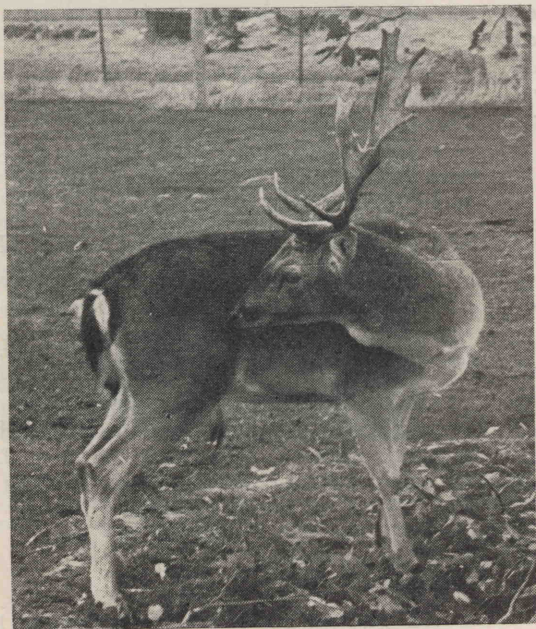
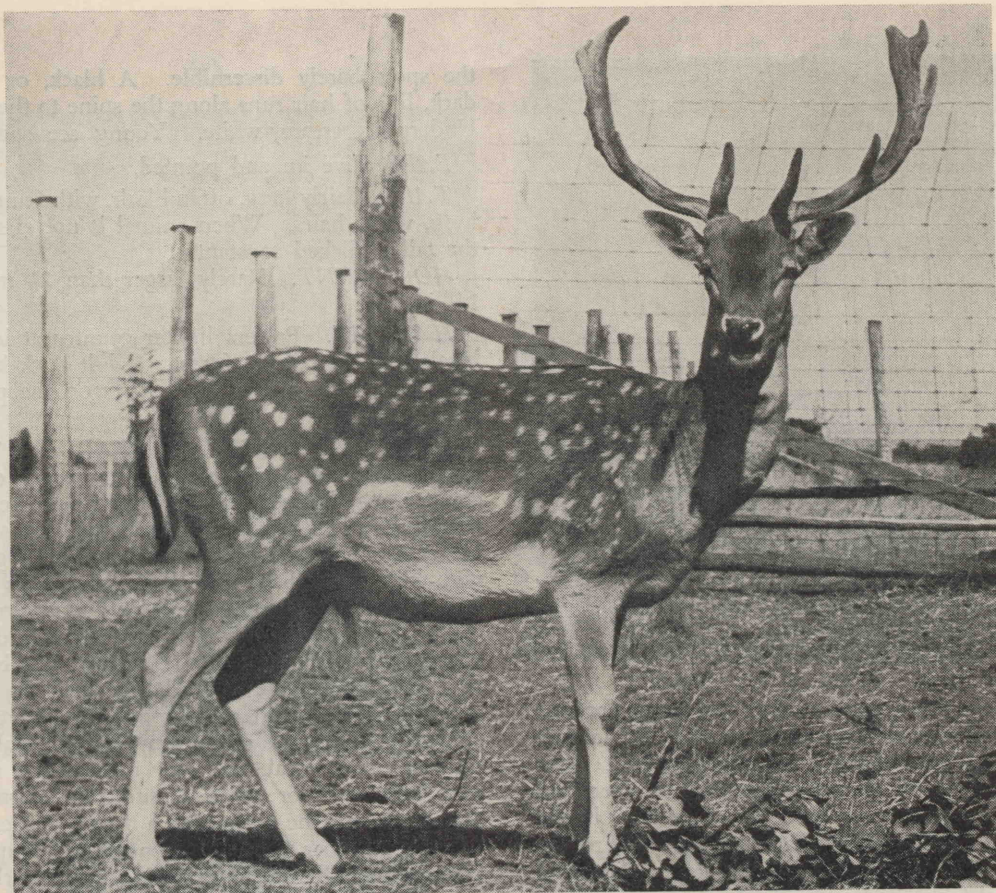


Plate III : FALLOW DEER.—(Above) Fallow buck, summer coat, antlers still in velvet but fully grown. Note long hairs on sheath, black tail with white underside, white tail patch, flattening of antlers. (Left) Fallow buck, winter coat (same animal as above). Note no spots although sometimes these may be carried all year round.



Plate IV : SAMBAR DEER.—(Above) Sambar stag. Note raised tail and fringe of longer hair at throat. (Left) Sambar hind about 2 years old. Note star of turned hair on base of neck common to all Sambar. Small area of bare skin here sometimes. Note size of ears. (Below) Sambar hind.



EARS. Strikingly large (7 in. +), round and bat-like.

PROMINENT GLANDS. In front of the eye, these are everted in alarm and are most noticeable.

TAIL. Varies in length, but frequently long (to 12 in.) and bushy.

HOOFPRINTS. Rarely larger than $2\frac{3}{4}$ in. $\times$ $1\frac{7}{8}$ in.

DROPPINGS. Usually in groups.

HABITAT. Heavy forest on the fringe of settlement or natural clearings. Readily adaptable to lighter country where adequate cover is available.

SIGHTING UNDER 50 YARDS. Very round ears with a surround of grey often noticeable. Large gland in front of the eye distended in alarm. Fringe of longer hair about the neck and throat erected. Compact, dark body; head held low when moving in cover; rump appears higher, nose thrust forward, antlers along back. Sambar may allow a very close approach if they are in cover or very close to it and they feel they have not been seen. The hearing of a short, heavy, crashing run with or without a glimpse of the light-coloured under-tail patch is frequently the observer's first indication of the presence of sambar. Unless the animal is injured, the tail is always raised on alarm and one of the most usual views of a sambar in cover is the flesh-coloured skin on the underside of the raised tail and the large, light-coloured rump patch. In the case of the stag, this sighting may sometimes be preceded by a most startling honk, quite unique in deer sounds in its intensity. Hinds may bark repeatedly at a distance. A hind with a very young calf may stand momentarily and stamp the fore-foot before moving off. Sambar prefer to go under obstacles rather than jump them. The stag's antlers are six-tined and the velvet of the growing antlers is grey. These deer wallow.

References.

BENTLEY (1967) : 19, etc.

RINEY (1955) : 14 and 17.

RED DEER (*Cervus elaphus*) (Plate V).

SHOULDER HEIGHT. To 48 in.

WEIGHT. Up to 500 lb. has been recorded, but the adult stag weighs 300 to 350 lb., the hind about 200 lb.

COLOUR. Invariably the red shade, from which this deer gets its name, is visible but in winter they are a duller brown. There is a large straw-coloured patch about the buttocks and this extends onto the back above the tail. During the rut, the stag develops a conspicuous mane and in common with many deer, the neck thickens. Young calves are spotted white.

EARS. Rather long (7 in.), but narrow and pointed.

TAIL. Very short.

HOOFPRINT. Round-toed and large, about 3 in. $\times$ 2 in.

DROPPINGS. Often in groups but frequently found in lines, being dropped as the animal walks.

HABITAT. Adaptable but prefers mountainous or undulating forest.

SIGHTING UNDER 50 YARDS. The red deer is an animal with a strongly developed herd system. Usually four or more animals are seen, depending on the density of population. Groups of stags and groups of hinds and young may be seen. The stag marshals a number of hinds during the rut. The most noticeable characteristic is usually the reddish colour and the light-coloured rump patch which extends over the tail. Hinds will frequently bark on alarm and may continue to do so as they move off. The antlers of the adult stag are often multi-tined. The colour of the velvet of the growing antler is grey. During the rut, the stags roar frequently in the early morning and late afternoon. The roar is a cattle-like bellow or shorter variations. A reasonable imitation will usually be answered readily by the stag, followed by a closer approach to the 'caller'.

REFERENCES.

BENTLEY (1967) : 43, etc.

PAGE (1962).

RINEY (1955) : 6-8.

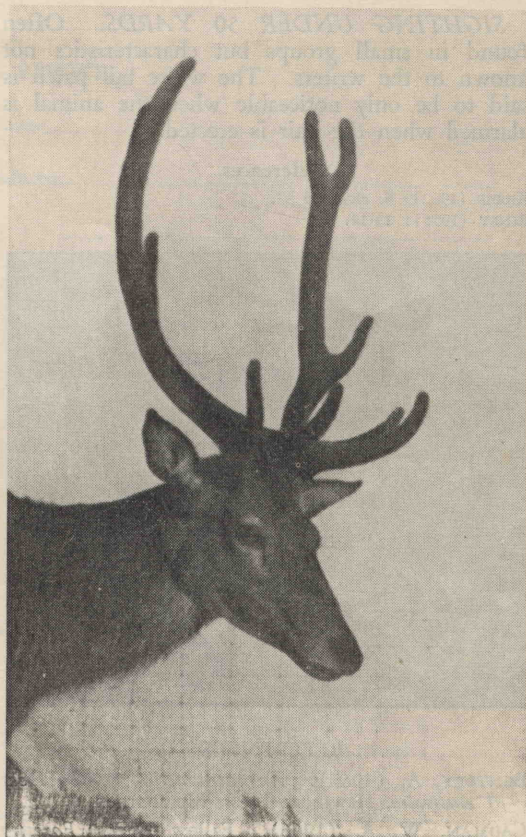
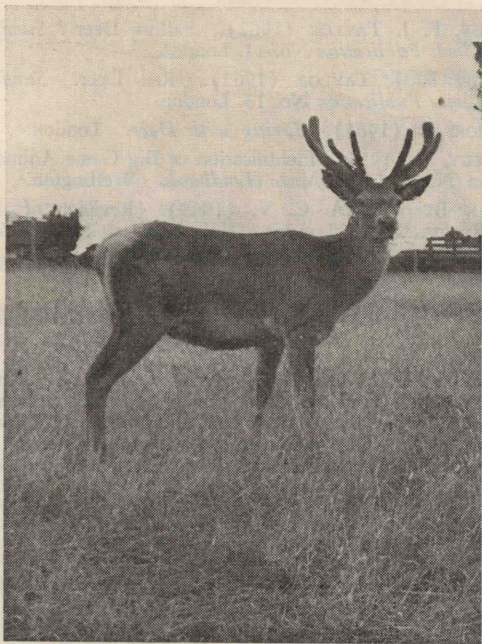


Plate V : RED DEER.—(Above and right) Red stag. (Below) Red Deer hind. Note short tail and light-coloured rump patch extending onto back above tail.



SIKA DEER (*Cervus nipon*) (Plate VI).

(Pictured on page 12.)

SHOULDER HEIGHT. To 38 in.

WEIGHT. To 180 lb.

COLOUR. Chestnut-red with white spots in summer ; uniform grey in winter. White rump patch throughout the year. The young are spotted white.

EARS. Round and bat-like.

TAIL. Long (10 in.), white on the underside.

ANTLERS. Usually eight-tined in the adult stag. The velvet is a golden colour with black patches.

HABITAT. Adaptable to a wide range of cover but prefers forest and dense scrub.

SIGHTING UNDER 50 YARDS. Often found in small groups but characteristics not known to the writers. The white tail patch is said to be only noticeable when the animal is alarmed when the hair is erected.

References.

- KIDDIE (1962): 6, etc. and 33.
RINEY (1955): 13-14.



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WHITEHEAD, G. K. (1950). *Deer and Their Management*. London.

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Plate VI: SIKA DEER.—(Left) Sika stag. Note white spots and tail and position of white rump patch; prominent glands on hind leg. (Below) Sika hind. Note white spots and tail, position of rump patch; prominent light-coloured gland on hind leg.

(Photographs R. Prior, "Living with Deer", Deutsch Lond., 1965.)



Appendix 1.

DEER SIGHTING REPORT.

Name.....

Address.....

Date.....

Locality.....

For deer seen
while hunting

Number of deer not seen close enough to classify ☐Number of HINDS ☐Number of STAGS ☐Number of CALVES ☐Number of YEARLINGS ☐

Shape of antlers :—See Figure 1 and record whether type A, B, C, D, or E.

Appendix 2.

DEER SPECIMEN REPORT.

Name.....

Address.....

Date.....

Locality.....

For each deer shot

1. SEX.

Stag		Antlers present	Soft velvet	Hard polished	Number of tines	Testes enlarged	Antlers freshly cast
		☐	☐	☐	☐	☐	☐
Hind		Pregnant	Udder with milk	Udder without milk	Calf at foot	Foetus present	
		☐	☐	☐	☐	☐	☐

2. WEIGHT.

.....lb. (Valuable if can be obtained.) Note: Dressed or whole weight.

3. SIZE.

The following measurements are useful if these can be obtained. See *Figure 2*.

Total length: tip of nose to end of last tail vertebrae. Lay the deer on its side and pass tape along curvature over face, head, neck, spine and part of tail. ☐

Height at shoulder: vertical distance from tip of the hoof of a foreleg to a point on the mid-line between the shoulders. ☐

Girth: the circumference of the chest cavity immediately behind the forelegs. ☐

4. JAWBONES.

Collect both lower jawbones, label with number.....

5. FOOD.

Collect about $\frac{1}{2}$ lb. food from rumen and preserve in ten per cent. formalin.

6. NOTE.—disease, parasites, malnutrition, etc.