

INDIAN FOREST RECORDS

(New Series)

WILD LIFE AND RECREATION

Vol. 1

No. 1

GLOSSARY OF TERMS USED IN NATURE CONSERVATION AND WILD LIFE MANAGEMENT

(With notes on important Animals and Birds)

By

P. VENKATARAMANY, M.A., I.F.S. (Retd.)

EDITOR, EDITORIAL BOARD,
FOREST RESEARCH INSTITUTE & COLLEGES,
DEHRA DUN.



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ERRATA II

Page 7 (L), 1st line under "Catfish", for "Siluroidea" read "*Siluroidea*".

Page 21 (L), line 6th under "Kheddah", for "cf." read "Cf."

Page 27 (L), 11th line under "Pangolin", for "hill," read "hills" (delete the comma).

Page 29 (L), 1st line from bottom, under "Pintail", for "able" read "table".

Page 55, in Appendix I-c, under Fish Hatcheries, read the information shown under column 2 as under column 3 and that shown under column 3 as under column 4.

Page 65, against-S. No. 26, under column 4, insert ")" i.e. close bracket mark after "Himalayas".

Page 25 (R), line 5 under "Natural History": substitute comma for full-stop after life.

GLOSSARY OF TERMS USED IN NATURE CONSERVATION AND WILD LIFE MANAGEMENT

(*Indian Forest Records—Wild Life and Recreation Series, Vol. 1 No. 1*)

ERRATA

(Letters 'L' and 'R' stand for left and right hand half of the page respectively.)

- Page (viii), line 7 from top : for "c.f." read "Cf."
- Page 6 (L), line 7 under "Buzzard": delete "other".
- Page 7 (L), Caption "Cervus duvauceli": for "duvauceli" read "duvaucelli"
- Page 7 (L), Caption "Cervus unicolor niger": for "niger" read "nigra".
- Page 8 (R), Caption "Comb-duck Nukta": insert colon after "duck".
- Page 8 (R), line 10 under "Comb duck": for "ready" read "reedy".
- Page 9 (L), line 4 under "Control": delete comma after "nutritional".
- Page 9 (L), line 5 under "Control": delete "(" mark after "agency".
- Page 9 (L), line 7 under "Control": insert "(" mark after "means".
- Page 10 (L), line 9 under "Crane": for "enourmous" read "enormous".
- Page 10 (R), last line: for "sub-species" read "sub-species".
- Page 11 (L), line 11 from bottom: for "unicolour" read "unicolor".
- Page 13 (R), line 8 under "Elephant": for "Loxoanta" read "Loxodonta".
- Page 15 (R), line 6 under "Fowl": for "sonneratti" read "sonneratii".
- Page 15 (R), line 15 under "Fowl": for "northesrn" read "northern".
- Page 16 (L), line 2 under "Game birds": delete comma after "are".
- Page 16 (L), line 10 under "Game birds": for "sos-called" read "so-called".
- Page 17 (L), line 2 under "Goral": for "Nemorhadus" read "Naemorhadus".
- Page 17 (R), line 4 under "Hawk": delete two commas and insert full-stop after "claws".
- Page 18 (R), 1st line under "Hilsa": delete asterisk mark.
- Page 20 (L), line 4 under "Ibex": for "matars" read "mitars".
- Page 20 (R), line 3 under "Indian darter": for "line" read "lined".
- Page 20 (R), 1st line under "Interbreed": delete asterisk mark.
- Page 22 (L), 1st line under "Leopard": insert comma after "ferocious".
- Page 23 (L), line 10 from bottom: for "Mahi" read "Mahsir".
- Page 24 (L), 1st line under "Mongoose": for "forms" read "form".
- Page 25 (R), line 22 under "National Park": for "1962" read "1952".
- Page 25 (R), line 5 under "Natural History": substitute comma for full-stop.
- Page 25 (R), 1st line under "Natural Science": delete asterisk mark.
- Page 27 (L), last line: delete asterisk mark.
- Page 27 (R), 1st line under "Parasitism": delete asterisk mark.
- Page 27 (R), line 5 under "Parasitism": delete "See Parasite".

- Page 31 (R), line 10 under "Range": *insert* comma after "cattle".
- Page 33 (L), line 11 under "Sanctuary": *delete* "Sanctuary".
- Page 34 (L), line 8 under "Species": *delete* "species of the" after "other".
- Page 35 (L), line 7 under "Stork": *for* "ADJPTANT" *read* "ADJUTANT".
- Page 36 (L), after the caption "Teal": *delete* "(*Querquedula*)".
- Page 36 (L), in the caption "Threskiornis melanocephala": *for* "melanocephala" *read* "melanocephalus".
- Page 44, line 2 against "Kerala- S. No. 1" under col. 6: *for* "sq. miles" *read* "sq km".
- Page 44, against "Madhya Pradesh- S. No. 7" under col. 4: *for* "19.6" *read* "16".
- Page 45, against "Mysore- S. No. 4" under col. 4: *for* "60" *read* "57".
- Page 52, against "Himachal Pradesh- S. No. 17" under col. 3: *for* "63-69" *read* "53-69".
- Page 52, against "Himachal Pradesh- S. No. 20" under col. 6, 1st line: *insert* "deer" after "Spotted".
- Page 55, Caption of col. 2: *delete* "of the National Park (year of formation)" after "Name".
- Page 60, Caption (viii): *for* "Goa" *read* "Goats".
- Page 60, col. 2 against S. No. 32: *for* "Himalayan" *read* "Nilgiri".
- Page 60, col. 2 against S. No. 33: *for* "Nilgiri" *read* "Himalayan".
- Page 68, under "Scientific name" against "Chinkara": *delete* "gazella" after "Gazella".
- Page 68, line 6 from bottom under "Scientific name": *for* "Tetragallus" *read* "Tetraogallus".
- Page 68, line 4 from bottom: *delete* comma after "Comb".
- Page 69, under "Scientific name" against "Deer, ravine": *delete* "gazella" after "Gazella".
- Page 70, under "Scientific name" against "Gazella, Indian": *delete* "gazella" after "Gazella".
- Page 72, under "Scientific name" against "Snow cock": *for* "Tetragallus" *read* "Tetraogallus".
- Page 74, line 18 from top under "Scientific name": *for* "Ardea" *read* "Ardeola".
- Page 75, line 10 from bottom under "Scientific name": *delete* "gazella" after "Gazella".
- Page 75, line 5 from bottom under "Scientific name": *for* "Haliastur" *read* "Haliastur".
- Page 76, under "Common name" against "Milvus migrans": *for* "Knite" *read* "Kite".
- Page 77, line 9 from bottom under "Scientific name": *for* "Tetragallus" *read* "Tetraogallus".
- Page 78, against S. No. 11 under col. 3: *for* "7000" *read* "6600".
- Page 79, against S. No. 16 under col. 3: *delete* "Do" and leave this column blank.
- Page 80, against S. No. 36 under col. 2: *for* "Thar" *read* "Tahr".

**GLOSSARY OF TERMS USED IN "NATURE CONSERVATION AND
WILD LIFE MANAGEMENT"**

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P R E F A C E

A glossary is a collection of difficult terms pertaining to a special area of knowledge or concerning their usage in any particular discipline. The meanings and explanations of the terms are also given. Such a glossary is essential for any science or discipline in order that information can be recorded and communicated, not only with ease, but also with precision. Wild Life Management and Nature Conservation is no exception. The first glossary on this subject was issued in 1961, as Leaflet No. 4 by the Indian Board for Wild Life, Ministry of Food & Agriculture, Department of Agriculture, New Delhi. Since then, wild life conservation and management has received great attention in the Indian Forest College and the Rangers Colleges where it forms part of the curriculum. The Forest Departments of States and Union Territories have also established separate administrative units for Wild Life and developed many National Parks, Game Sanctuaries and Shooting Blocks with a view to increasing amenities for recreation, wild life observation and hunting and also for preservation of our fast diminishing fauna wherever necessary. It is, therefore, considered appropriate to issue this Glossary at this stage. It is intended to stimulate thought on this subject among all lovers of wild life.

I am happy to record here my appreciation of the prodigious industry and diligence put in by Shri P. Venkataramany in completing this work in a short time.

NEW FOREST,
DEHRA DUN.

Dated 13-12-1965.

T. N. SRIVASTAVA,
President,
Forest Research Institute and Colleges.

INTRODUCTION

During the course of preparation of the typescript for "Indian Forest and Forest Products Terminology—Part II, Forest Products Research, Extraction, Utilization and Trade", the idea of preparing a separate "Glossary of terms used in Wild Life Management and Nature Conservation" arose and this idea was pursued, and the work has now been completed. It is hoped that this will serve the needs of all sportsmen and of all lovers of wild life. Opportunity has been taken to introduce several useful Appendices and a Bibliography.

The preparation of this Glossary is an index of the new interest being increasingly taken by one and all in the preservation of wild life. I hope this book will help in focussing attention and engaging the interest in this fascinating subject among all people, young and old.

I shall be grateful to receive comments and criticism of this book so that errors and omissions, if any, can be eliminated at the next revision.

To the many friends of the Forest Research Institute & Colleges who gave me unstinted help at all times, I wish to express my grateful thanks. Shri Saharia and Shri Bharat Singh of the Indian Forest College were good enough to read the typescript and offer me useful suggestions. I am specially beholden to Shri T. N. Srivastava, President, Forest Research Institute & Colleges who gave me valuable help and advice at all times.

NEW FOREST,
DEHRA DUN.

AUTHOR

Dated : 13-12-1965

GUIDE TO THE USE OF THE BOOK

1. *The entry words and their arrangement*

All entries including single terms, abbreviations, combining forms and compounds of two or more words have been entered in strict alphabetical order. If two or more variant spellings of a single word exist (e.g. *Biocenology*; *Biocoenology*) each is entered in its proper place and the definition and variant spellings are given in the form most frequently used, the others being cross-referenced to this. Where the variant spellings are so nearly alike that they would normally appear in consecutive or nearly consecutive order, the less frequent form is entered directly after the main entry word, e.g., *Estivation*; *Aestivation*.

Where the term consists of a single word, there is naturally no difficulty about its position. Where a term is made up of more than one word, it has been placed under what was believed to be the natural key word, followed by modifying words. For instance *Zoological garden* has been entered under *Zoological*; *Catchment area* under *Catchment*; while *Home range* has been entered as *Range, home*. In a large number of cases, it was considered advantageous to group together closely connected terms such as those dealing with *Erosion, Game, Hunting, National Resources* and *Sustenance foods*. This has been done but the terms have again been given, as far as possible, in their alphabetical positions with cross references to the places where the full definitions will be found. Where articles are grouped, their order in relation to other articles in the same group is determined, thus: simple one word heading—such as *Climax*; compound headings with the simple word followed by comma, such as *Climax, climatic*; compound headings with the simple word followed by one or more words such as *Climax vegetation*. Where a compound term such as *Hunting pressure* has been defined under a word other than the first (i.e. under *Pressure*) the first word also has been entered in its alphabetical position (*Hunting*), with cross reference to the position where the definition is given.

For convenience of readers, a few examples of the system as applied to some difficult combinations of words are given below.

Entries divided by a comma

When a comma occurs in an entry, words after the comma are disregarded and the entry is arranged as if it consisted only of the word or words before the comma. Several entries with the same common entry term are arranged alphabetically with reference to the words after the comma.

Migration	Hunting
Migration, altitudinal	Hunting box
Migration, caladromons	Hunting ground
Migration, diurnal	Hunting pressure
Pressure	Range
Pressure, hunting	Range, home
Erosion	Food chain
Erosion cycle	Food conversion
	Food cycle

Hyphenated entries

If the word before a hyphen is a separate word in its own right, the entry is to be considered as two separate words.

Zoo	Food cycle
Zoo-geography	Food-gatherer

2. *Synonymy*

Numerous synonyms are in use in different parts of the English-speaking world and it has been necessary for Indian foresters to draw many terms from the U.S.A. and Commonwealth countries. Hence synonyms have been given wherever considered necessary.

3. Abbreviations and signs used in this work

Abbreviations in current usage appear in their alphabetical place in the body of the text. A list of abbreviations used in the text itself is furnished below.

Abbr.	Abbreviation(s)
Adj.	Adjective
Ant.	Antonym
c.f.	Confer, compare, make a comparison with.
deprec.	Deprecated
e.g.	<i>Example gratia</i> , for example
esp.	Especially
N	Noun
obsol.	Obsolete
pref.	Preferred
syn.	Synonym
*	Sign to indicate that the word following the asterisk is dealt with separately in its alphabetical position.

4. Terms from different sciences

The following abbreviations have been placed immediately after the terms, in brackets, to signify the particular branch of science from which the terms were derived.

Biology (*Biol.*)
 Botany (*Bot.*)
 Ecology (*Ecol.*)
 Entomology (*Entom.*)
 Hunting
 Wild life
 Zoology (*Zool.*)

5. Use of Asterisk

An asterisk is used in definitions to indicate that the term in question is itself defined and that it would be helpful in the given context to consult that definition. In terms of more than one word, the asterisk precedes the key word, e.g.:—

Population pressure. (*Biol.*) The sum total of all factors, such as increase in population, decrease in available food supply, etc. which tend to reduce the capacity of the environment to support the population. If the pressure is not released, *migration or expansion of *range, or extinction or decline in population will result.

This means that both the asterisked terms are defined under *Migration* and *Range*.

Small game. *Game birds and *mammals not classed as *big game. See *Game*.

This means that all the terms asterisked, e.g., *Game birds*, *mammals* and *big game* are defined under *Game birds*, *Mammals* and *Big game*.

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A

Abhayaranya

A forest where animals can roam without fear of man. See *National Park*; *Sanctuary*; *Sanctum sanctorum*.

Aerial strip census

A *census of wild life taken from both sides of an aircraft flying along specified lines. Sampling techniques are used to compute the results.

Aestivation

The state or condition of torpidity or dormancy induced by heat and dryness of summer, as opposed to hibernation.

Age Ratio

This provides an indication of population density where numbers cannot be readily counted as among rabbits and ducks. Numbers examined in hunter's bags provide information on age ratios that make it possible to measure the season's reproductive success and rate of population recruitment, and to estimate the allowable harvest. See *Density*.

Albinism

Lack of normal coloration in a person, animal or plant.

Albino

Animal or plant, otherwise healthy, but showing marked deficiency in pigmentation. Examples: persons with a pale, milky skin, light hair and pink eyes; also the white tiger of Rewa.

Alpine

The term is applied to a zone of vegetation or the species of flora or fauna found in that zone. In India the alpine zone is confined to the Himalayas at altitudes over 2,700 m. An alpine zone is usually characterised by grassy meadows and stunted vegetation with snow during winter.

Angler

A person who catches fish for sport or for food with rod and line. NOTE. The term is also applied to a species of sea fish because the first ray of the dorsal fin is modified to form a "rod" which suspends bait for little fish; the mouth of the fish is close by, ready to seize the prey.

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Animal

An organised being having life, sensation, and voluntary motion — typically distinguished from a plant, which apparently has no sensation or voluntary motion. The term includes mammals, birds, reptiles, etc. Sometimes used (unscientifically) to denote mammals only.

Ant-eater, Scaly

See *Pangolin*.

Antelope

Any of a group of swift, cud-chewing, horned, deerlike, cloven-hoofed animals, related to oxen, goats, deer, etc. It includes the chamois and the gazelle. Cf. *Deer* which have deciduous horns or antlers. Antelopes found in India are given below:

FOUR-HORNED ANTELOPE OR CHOUSINGHA (*Tetracerus quadricornis*). This is found in Peninsular India south of the Himalayas where the country is wooded and hilly, but not too densely forested. It is not found on the Malabar coast. It is the only antelope with two pairs of horns of which the front pair is always the shorter. A pair of well-developed glands are found between the false hoofs of the hind legs. The colour of its coarse coat is dull red brown above and white below.

INDIAN ANTELOPE OR BLACK BUCK (*Antelope cervicapra*). A long-horned antelope that is brownish black above and white below. This is the sole representative in India of the genus *Antelope*, and is perhaps the most beautiful of all its kind. It is found all over the Indian plains except on the Malabar coast. It avoids forest or hill tracts. It has beautiful spiralled horns. Black Buck are usually seen in herds of 20 or 30; in Rajasthan and Punjab gatherings may number several hundreds.

NILGAI: BLUE BULL. See *Nilgai*.

Anthropomorphism

An interpretation of what is not human or personal in terms of human or personal characteristics, e.g., attributing to animals the same thoughts, reactions, emotions, etc., as are experienced by human beings.

Arboretum. Plural *Arboretums*; also *Arboreta*.

A place where trees, shrubs and herbaceous plants are cultivated for scientific and educational purposes. Cf. *Botanical garden*.

Artiodactyla

Even toed *ungulate mammals, with the axis of each foot falling between the third and fourth toe. Contains deer, sheep, antelope, cattle, pigs, camel, giraffe and hippopotamus.

Asiatic (or Himalayan) Ibex

See *Ibex*.

Ass (*Equus onager*, *E. hemippus*, *E. hemionus*, etc).

A quadruped related to the horse, but smaller, with tuft at the end of tail, and long ears. It has descended from the wild ass (*E. asinus* or *E. taeniopus*) of Abyssinia. In India, the Indian Wild Ass (*E. hemionus khur*) is found in the Rann of Cutch and parts of the desert zone of North-West India. One other species, the Wild Ass of Tibet; occurs in Ladakh and Tibet. The Indian wild ass is probably the only true wild ass left in the world. It is a handsome creature, about 12 *hands high (48" = 120 cm); it is bigger than domestic donkeys which are only 9½ hands (37" = 94 cm) high. It has short ears like those of a zebra.

Autecology

Study of the *ecology of individual species as opposed to the study of communities. Cf. *Synecology*. See *Ecology*.

Aves: Birds

Class of vertebrates, having feathers, warm blood and wings formed from the forelimbs. Birds are known to have evolved from primitive, extinct reptiles.

B**Badger, honey; or Ratel (*Melivora capensis*)**

This is an animal of Africa and South-Western Asia. In India, this is found from the base of the Himalayas to Kanya Kumari. It lives in the desert and in the dry and moist deciduous zones, avoiding regions of heavy rainfall. It prefers hilly broken country where shelter is easier to find, and when living in the plains chooses the banks of streams or rivers where burrows are easily dug. The body of Ratel is squat and bear-like; the legs are short and stumpy, tail small, feet broad and long and the claws blunt. Underparts are deep black contrasting vividly with the pale dorsal surface. It is intermediate between a *weasel and a *bear, and defends itself fiercely against attack.

Bag (Hunting)

The total kill of a day's hunting. Also a sportsman's take of game in a particular area or period.

Bait (Fishing)

Food (bread, cheese, etc.), worms, etc. put on hook or used in *spinning to lure fish.

Bait (Hunting)

Usually a live (domestic) animal tied up to attract and locate tiger or leopard. Also, any food or substitute, used as a lure in trapping, etc.

Balance of nature

A state of equilibrium in nature due to the constant interaction of the whole biotic and environmental complex. NOTE. It is the relationship which connects the four vital elements, water, soil, fauna and flora in a "balance". Animate and inanimate life are balanced in nature. Any interference with this equilibrium (e.g., by human intervention) is often harmful.

Balanced population

Natural population in a particular land area or body of water that maintains itself year after year with little fluctuation in number of individuals in spite of regulated hunting or fishing.

Bandicoots (Genus *Bandicota*)

The mole bandicoot is largely a creature of fields and forest, but the other bandicoots found in India are essentially parasites on Man, living in or about human dwellings. Here from their burrowing habits they do much damage to grounds and floorings. Their large size is sufficient to distinguish bandicoots from other house rats. Four species are known from Peninsular India.

Barbel

Any of various species of fish belonging to the genus *Barbus* (so called as they are equipped with barbels on the upper jaw). *Barbus mosal* is the mahseer of India. It is by far the finest fish from the angler's point of view. It is found in most hill streams.

Barking deer

See under *Deer*.

Bear

A large heavy, clumsy plantigrade *mammal, of the genus *Ursus*, and related genera, with shaggy and thick fur and a very short tail, native to temperate and arctic zones. Commonest Indian varieties are:

BROWN BEAR (*Ursus arctos*). A bear with brown fur found in Europe, Africa, Asia, etc. The Indian race is said to be distinctive from its paler coat and smaller build. It is found on higher levels of north-western and Central Himalayas. Its heavier build and brown coat will suffice to distinguish it from the Himalayan black bear.

HIMALAYAN BLACK BEAR (*Selenarctos thibetanus*). It is confined to the Asian countries,

Bear—contd.

and in India it occurs in Kashmir, Himalayas and Assam. Its shorter smoother coat and black claws distinguish it from the sloth bear. Its general colour is typically black.

SLOTH BEAR (*Melursus ursinus*). A bear with a shaggy black fur, flexible snout and long white claws, found in the forested tracts of India and Ceylon from the base of the Himalayas southwards.

Beat (Hunting)

(a) A patch of forest which is beaten up for game. See *Beating*.

(b) Actual beating of the forest for driving out game.

Beater (Hunting)

A person employed in beating or driving game from *cover in a hunt.

Beating

See *Hunting* (BEATING).

Bharal: Blue sheep (*Pseudois nayaur*)

This is a ruminant mammal, intermediate in structure and habits between a sheep and a goat; it has rounded smooth horns, curving backwards. Typically a Tibetan animal, it is found also in Ladakh, Sikkim and Nepal.

Big bore (of a rifle barrel)

Having an inside diameter greater than 0.22 inch. Cf. *Small bore*.

Big game

The large animals, sought or taken by hunting for pleasure, or sport. See *Game*.

Binomial nomenclature (or Binominal nomenclature). (*Biol.*)

The system, introduced by Linnaeus, of denoting an organism by two Latin words, the first the name of the *genus*, the second the specific name or epithet. The two constitute the name of the *species; e.g., *Homo sapiens*, *Acacia arabica*. See *Species*. See also *Classification*.

Biocenology (Biocoenology)

Biology concerned with the study of natural communities and the interaction of the members of such a community.

Biochore

A group of similar *biotypes (as tropical wet evergreen forests).

Bioclimatics

The science of relating the climatic characteristics of a locality in which certain plants grow to those of another of similar properties where the same plants may be introduced and grown successfully. The term can be extended and applied to wild life also(?)

Biocoenosis (Ecol.)

The association of animals and plants together, especially in relation to any given feeding area. Syn. *Biocoenosium*. Such a community, comprising both animals and plants.

Biocycle

A group of related *biochores constituting a major division of the *biosphere. The biocycles usually recognised are saltwater, fresh water and terrestrial.

Biodynamics

The branch of physiology that deals with life processes of plants and animals. Contrast with *Biostatistics*.

Bioecology

The study of both plants and animals acting together; a combination of plant and animal ecology.

Biogenesis

The theory that living organisms come only from other living organisms and not from non-living matter.

Biogeography

Branch of biology dealing with the geographical distribution of animals and plants. This includes both *zoo geography and *phytogeography.

Biological balance

A dynamic equilibrium existing between the members of a stable natural community. It is the resultant of all the effects of the constituent organisms on one another. Such effects include food chains, parasitism, *predatism. It represents the evolutionary adjustment between breeding pressure and environmental resistance.

Biological control

Attack on noxious organisms (e.g., insects) by interference with their ecological adjustment, such as by the introduction of parasites not previously present. Artificial application of *biotic control.

Biological minimum

The theoretical, minimum population level of a species, which forms the *extinction threshold. NOTE. Below this level the organism fails to survive.

Biological rank

The *social rank of a species or genus. See *Peck order*.

Biological surplus (Wild Life)

The number of animals in excess of the carrying capacity during the "pinch period", i.e.,

Biological surplus (Wild Life)—contd.

the period of adverse factors, such as winter. NOTE. Hunting, fishing and trapping are biologically sound when the take does not exceed the biological surplus.

Biology

The science of life. A branch of knowledge dealing with living organisms and vital processes; this broadly includes zoology, botany, morphology, genetics, embryology and allied sciences, but commonly restricted to considerations of wide application to the origin, development, structure, functions and distribution of living matter as represented by plants and animals and to be generally recurrent phenomena of life, namely growth, development, reproduction and death.

Biometry

Application of statistical methods to the study and interpretation of living organisms.

Biosphere

The part of the world in which life can last including parts of the lithosphere and atmosphere. The living beings together with their environment.

Biostatistics

The branch of physiology that deals with the relation of structure to function in plants and animals. Contrast with *Biodynamics*.

Biotic

The animal and plant life of a region, *i.e.*, the flora and fauna.

Biotic (Adj.)

Of environmental factors which are due to living organisms, as opposed to physical factors such as light and temperature.

Biotic climax

A *climax community maintained in a stable condition by some biotic factor, *e.g.*, grassland which is prevented by grazing from passing into woodland. Cf. *Climatic climax*, *Edaphic climax*.

Biotic control

Check on the increase of population of an animal, insect or plant through disease-producing organisms, such as fungi, bacteria, insect *parasites and *predators, etc. See *Control (Entom.)*, and other articles under *Control*.

Biotic factors

Influences for which living organisms are responsible as contrasted with climatic and edaphic factors. Usually restricted to the influence of animals, including man.

Biotic potential

- (1) The inherent capacity of an organism or species to reproduce and survive. This is expressed in terms of numbers that could be produced under optimum conditions and in the absence of environmental resistance.
- (2) *Carrying capacity.

Biotic province

A geographical region characterised by the presence of one or more ecological associations that differ at least quantitatively from those of adjoining provinces and marked by a tendency to act as a centre of ecological dispersion.

Biotype

A region uniform in environmental conditions and in its population of animals and plants for which it is the habitat.

Bird

Any of a group of warm-blooded vertebrates with feathers and wings, belonging to the Class *Aves*. NOTE. The ornithology of India is not so rich in specimens of gorgeous or variegated plumage as that of other tropical regions. The Peacock, *Pavo cristatus*, is the national bird of India. The parrots are remarkable for beauty. Four vultures are found including the common scavengers, *Gyps indicus* and *Pseudogyps bengalensis*. Of falcons, there are the peregrine (*Falco peregrinus*), the shereen or royal falcon (*Falco peregrinator*), and the lagar (*F. jugger*), which are all trained for hawking. Among hawks, the shikra (*Astur badius*), the goshawk (*A. palumbarius*) and the sparrow hawk (*Accipiter nisus*) deserve mention. King fishers and Herons of different kinds are sought for their plumage. The mynah (*Acridotheres tristis*), a member of the starling family, lives contentedly in a cage and talks well. Snipe, pigeons, partridges, quail, plover, duck, teal, sheldrake, wigeon—all of several varieties make up the list of small game.

Bird of prey

Any of a number of flesh-eating birds as the eagle, the hawk, the owl, the vulture, etc.

Bison or Gaur (*Bos gaurus*)

Found in India is not a true bison at all; it is a wild ox, the largest of the bovines though in common parlance it is called "Indian bison". True bison is a bovine ruminant *Bison bison*, with high, well-haired shoulders, found in North America. The gaur is the embodiment of vigour and strength as it has a huge head, deep massive body and sturdy limbs. Gaur are distributed in the hill forests of India, and appear to attain their finest development in the South-Indian hill ranges and Assam.

Bite (Fishing)

Taking of *bait by fish in bottom fishing.

Black buck

See under *Antelope*.

Blank

A forest area with few or no trees, usually covered with grass.

Block

A main territorial division of a forest, generally bounded by natural features and bearing a local proper name. See *Shooting block*.

Biome

Major regional land community of the world, e.g., tropical grassland and savannah, northern coniferous forest, tropical rain forest.

Blue bull

See *Bull, blue*; or *Nilgai*.

Blue sheep

See *Bharal* or *Blue sheep*.

Boar, Indian Wild (*Sus cristatus*)

A species of wild swine, widely distributed in south and east Asia. It lives in grass or scanty bush jungle and sometimes in forest. It is very destructive to crops and in cultivated areas. The colour of the body is black mixed with grey, rusty-brown and white hairs.

Bos gaurus

See *Bison*.

Botanical garden

A garden, often with greenhouses, that is used for the culture and study of plants collected and grown for scientific and display purposes. NOTE. This aims at the conservation of plant species as living repositories of definite genetic constitution. It seeks to prevent the extinction of rare plant species. This is accomplished by growing them under suitable environmental conditions. Cf. *Arboretum*.

Botany

The science that deals with plants, their life, their structure, growth and classification. It is a sub-division of *biology concerned with plant life.

Breeding population

A population within which free inter-breeding takes place and evolutionary change may appear and be preserved.

Breeding potential. (Wild Life)

The theoretical breeding rate, under ideal conditions of an organism. NOTE. It is low in large animals, but very high in many fishes and insects. Breeding potential is an index

Breeding potential (Wild Life)—contd.

of the reproductive capacity of the species irrespective of survival to maturity. See *Biotic potential*; *Environmental resistance*.

Breeding range

The geographical area or region in which breeding is carried on by individual pairs of breeding populations of a particular type of animal.

Brow-antlered deer

See under *Deer*.

Buck, black

See under *Antelope*.

Buffalo, wild (*Bubalus bubalis*)

This occurs in the grass jungles of the Nepal Terai and the plains around the Ganga and the Brahmaputra in Assam. A few herds survive in parts of Orissa, adjoining the Raipur district of Madhya Pradesh in the former State of Bastar. Though it has a finer carriage the wild buffalo differs little in general appearance from the tame one, except perhaps that it is a sleeker, heavier, and more robust looking animal; like the domestic buffalo, the wild buffalo is a slaty black. The horns are flat and triangular in section, those of the cows are less massive and vary less in shape. Except for man, the tiger is the only enemy the wild buffalo has to fear, and against a vigorous bull even the tiger stands little chance.

Buffer

An animal, that, by serving as food for predators, cuts down the predation losses of another animal (as a game bird or animal) more desired in a community.

Buffer belts

Areas of suitable width around or adjacent to sanctuaries/parks, within which no shooting, other than that required for legitimate crop protection, will be permitted and within which no professional graziers will be allowed to establish cattle pens. Sometimes known as *Buffer zones*.

Bull, blue or Nilgai (*Boselaphus tragocamelus*)

A slate-blue *antelope of India. See *Nilgai*.

Bustards (*Otididae*)

Large, chiefly terrestrial game birds (genus *Otis*) of the Old World and Australia. They are related to the *cranes and *plovers. They are somewhat slow and stately on the ground, but are powerful fliers. They are first rate sporting birds and are excellent for eating. The Great Indian Bustard (*Choriotis nigricaps*) is found over a large part of peninsular India. As there is a danger of its extinction, it is given special protection throughout its habitat.

Buzzard

Any of various *birds of prey of various species belonging to genus *Buteo* and allied genera. Buzzards found in India are:

COMMON BUZZARD (*Buteo buteo*). It is difficult to distinguish this from *B. ferox*.

LONG-LEGGED BUZZARD (*Buteo ferox*). This is a heavy lumpish bird, with other colour varying from pale buff-brown and white to almost black. It is an abundant visitor to the plains of the Punjab, Rajasthan and Uttar Pradesh in winter, arriving in February and leaving in March.

C**Calling**

See *Hunting* (CALLING).

Canis aureus

See *Jackal*.

Canis lupus

See *Wolf*.

Capra ibex sibirica

See *Ibex*.

Capra falconery

See *Markhor*.

Caracal (*Felis caracal schmitzi*)

This is a kind of lynx, found in North Africa and south west Asia, with reddish fur and black-tipped ears and tail. The pelt of the animal is valued. In India, it is found in the drier parts of the Punjab, Rajasthan, Uttar Pradesh and Madhya Pradesh. An uncommon and elusive animal, it is fast approaching extinction and so requires special efforts for its preservation.

Carnivora

Group of placental mammals, mostly flesh-eating (cats, dogs, mongooses). Most have large incisor and canine teeth. Some carnivora (e.g., bears and giant panda) also feed on vegetation.

Carnivore

Flesh-eater, but not necessarily a member of *Carnivora. Opposed to *herbivore. See *Omnivore*.

Carp (*Cyprinus carpio*)

A fresh water fish inhabiting ponds and sluggish streams. Esteemed as food.

Carrying capacity. (*Wild Life*).

The population (as of one species of animal), for which a given area (as of water or forest or pasture), can provide essentials (such as food and cover) and thus support the popula-

Carrying capacity. (*Wild Life*)—contd.

tion without undergoing deterioration. It must be able to carry through the "pinch" period or period of greatest difficulty (such as winter). Regardless of other factors, the carrying capacity cannot exceed the *saturation point. NOTE. When herds of deer exceed the carrying capacity in a forest, permanent damage to growing stock or regeneration will result. In wild life management, carrying capacity denotes the optimum density of game which a given environment is capable of sustaining permanently. The term can be used for cattle grazing in pastures or reserved forests also. For this the term "grazing capacity" will be more appropriate. The capacity in game range is exceeded when a species becomes so numerous as to destroy or reduce in vigour its food plants. Ranges over-browsed by deer may require as much as 10 to 15 years to recover. Game management is concerned with measuring carrying capacity accurately and with clues for early detection of overpopulation.

Cat

A small, lithe, domesticated, soft-furred carnivorous quadruped, *Felis domesticus*. The term is also applied to any of various flesh-eating mammals related to the domestic cat, as the lion, the tiger, the leopard, etc., and belonging to the genus *Felis*. Types of cats are:

FISHING CAT. *Felis viverrina* common in north-east India. It does not appear ever to have been seen catching or eating fish.

GOLDEN OR TEMMINCK'S CAT (*Felis temmincki* Syn. *Profelis temmincki*). This is one of the rarest and most handsome of the wild cats. It grows to about 1.2 m (4' 2") in length and preys on sheep, goats as well as on birds and small mammals. Found in Assam. It is also found in Nepal, Sikkim, Burma and South-east Asia generally, as far south as Sumatra.

INDIAN DESERT CAT. (*Felis ornata* Syn. *F. constantina*). This is easily distinguished by its sports in the Indian desert region, and in the dry zone of Central India where this is found along with the jungle cat. Westward the range extends to north west India and Sind to North Africa and northwards to the steppes of Central Asia.

INDIAN JUNGLE CAT. (*Felis chaus*). This is the common grey-coloured animal found in jungles.

LEOPARD CAT. (*Felis bengalensis* Syn. *Priornailurus bengalensis*). Handsome little animal with dark brown or black spots on a bright background. Very ferocious and difficult to tame. Distributed in the forest regions of India from Kashmir and the Himalayas to Cape Kanyakumari.

Cat—contd.

MARbled CAT (*Felis marmorata* Syn. *Pardofelis marmorata* Martin.) Found in Nepal, Sikkim and Assam, extending to Burma and Malaysia.

RUSTY-SPOTTED CAT. (*Felis rubiginosa* Syn. *Prionailurus rubiginosus*) found in Gujarat. A species related to the leopard cat, about half or three quarters of the size of the domestic cat. Said to be found also along the Western Ghats and elsewhere in Southern India.

Catchment area: Catchment basin

A drainage area, especially of a reservoir or river.

Cat fish

Any of various fishes of the suborder Siluroidea, mostly inhabiting lakes and streams, especially in the tropics. They attain large sizes and are important food fishes, though the flesh may not be of the highest quality.

Census

A count of mammals, birds, etc., taken to ascertain the number of each species present in a given area at particular seasons of the year, in order to observe increases and decreases in numbers and to determine the measure of protection or control required.

Cervus duvauceli

See *Deer* (SWAMP DEER).

Cervus elaphus hanglu

See *Hangul: Kashmir stag*.

Cervus eldi eldi

See *Deer* (BROW-ANTLERED DEER).

Cervus unicolor niger

See *Deer* (SAMBHAR).

Cheetah: Chetah: Hunting leopard (*Acinonyx jubatus venaticus*.)

A leopard-like animal of Africa and south Asia, with a small head, long legs and a black-spotted tawny coat. It resembles the leopard, but has certain dog-like characteristics. It can be trained for *hunting antelopes. Said to have been common in the olden days (Akbar kept 1000 animals in captivity for hunting), it is now almost extinct in India. It is now found only in Africa. It is one of the animals needing special protection in India.

Chevrotain: Chevrotin

Any of a number of related, small, hornless animals of *Asia and Africa resembling the *deer. They are the most primitive of known *ruminants, found especially in India, Malay Peninsula and West Africa. The animal found in India is the Indian Chevrotain or

Chevrotain: Chevrotin—contd.

Mouse-Deer (*Moschiolo memina*) which occurs in the forested areas of Southern India at elevations up to about 1,800 m (6,000 feet).

Chinkara

Indian gazelle. (*Gazella bennetti*). Gazelles are small, swift graceful antelopes of the genus *Gazella* and allied genera, found in Africa, the near East, and Asia, with spirally twisted backward pointing horns. They are remarkable for their graceful movements and lustrous eyes. The Indian Gazelle is found in the plains and low hills of North Western and Central India, extending through the open lands of the Deccan to a little south of the Krishna river. The usual haunts of the Chinkara are the waste lands broken up by nullahs and ravines, scattered bush and thin jungle. A full grown male measures 65 cm (26") at the shoulder, weighs 23 kg (50 lb) and has horns rarely exceeding 25-30 cm (10"-12") in length.

Chital

Spotted deer. (*Axis axis* Syn. *Cervus axis*). This is the most common *deer of India and probably the most beautiful in the world. See *Deer* (CHITAL).

Choriotis nigriceps

See *Bustards*.

Civet

Any of several varieties of cat-like, carnivorous mammals of Africa, India, Malaysia and southern China, with spotted yellowish fur. It is valued for its civet, a thick, yellowish, fatty secretion with a musk-like scent, obtained from glands in the pouch near the sexual organs. The secretion is much used in perfumery and commercial supplies are got from the African civet (*Viverra civetta* Syn. *Civetictis civetta*). Types of civet cats found in India include:

COMMON PALM CIVET OR TODDY CAT. (*Paradoxurus hermaphroditus*). An arboreal, black-spotted or black-striped blackish brown civet with long coarse hair found in well-wooded regions, throughout India, excluding only the arid zone. *P. jerdoni*, PALM, the Brown Palm Cat is found in the hill ranges of South India.

LARGE INDIAN CIVET. (*Viverra zibetha*). A solitary creature, sheltering in woods and bushes, found in Upper Bengal and Assam.

SMALL INDIAN CIVET. (*Viverricula indica*). A tawny grey or greyish-brown animal with streaks on back and spots in the flank. This is found from the Himalayan foot-hills southwards to Kanyakumari. Some are kept under domestication for the extraction of civet from the scent glands.

Classification

Arrangement of animals and plants in a series of groups. The basic unit is the species *e.g.*, the peacock is *Pavo cristatus*. Species which are similar to each other are classified into genera. Similar genera are grouped into families; families into orders, orders into classes, and classes into phyla, for animals or divisions for plants. See also *Binomial nomenclature*.

Climatic zone

Divisions of the earth bounded by imaginary circles parallel to the equator, having the same climate. Four chief zones are polar, temperate, sub-tropical and tropical. A different classification recognizes five great divisions or zones of the earth's surface with respect to latitude and temperature. These are:

TEMPERATE ZONE. The region between the Tropic of Cancer and the Arctic Circle or between the Tropic of Capricorn and the Antarctic Circle.

FRIGID ZONE. The region between the Arctic Circle and the North Pole or between the Antarctic Circle and the South Pole.

TORRID ZONE. The belt of the earth between the tropics over which the sun is vertical at some period of the year. It lies between the Tropic of Cancer and the Tropic of Capricorn.

Climax (Ecol.)

The final stage of a *succession which continues to occupy an area as long as climate or soil conditions remain unchanged. At climax there is a stable plant community which is able to reproduce itself under the conditions created by itself. There is similarly a stable animal community.

Climax, climatic (Ecol.)

A stable plant community maintained in any given area by the prevailing climatic conditions. Also a similarly stable animal community.

Climax, edaphic (Ecol.)

A stable plant community maintained in any given area by the prevailing *edaphic conditions. Also a similarly stable animal community.

Climax vegetation (Ecol.)

The plant cover on any area that will hereafter remain stable or stable until climatic changes occur. See *Climax*.

Closed (Wild Life)

Restricted with reference to time and place for capturing, killing, shooting or poisoning *game (*e.g.*, blocks closed to hunting; a

Closed (Wild Life)—contd.

closed season for fishing). NOTE. The breeding season for any species of wild life is usually declared as a closed season.

Cobra (*Naja tripudians*)

A venomous snake found in India. When excited, it expands the skin of the neck into a broad hood with characteristic markings. The Indian Cobra (*Naja naja*) is found usually about settled areas and dwellings. This is yellowish to dark brown, usually with spectacle-shaped black and white markings on the expanded hood. Also called *Spectacled Cobra*.

Colonial animals

Animals which live in groups. Individuals are often attached to each other.

Comb-duck Nukta (*Sarkidiornis melanotos*)

This is a large goose-like duck glossy black above, white below with a spotted head and neck. The male has a black, fleshy knob (the comb) on the top of the beak, which becomes greatly developed in the breeding season. The typical race is found throughout India except the northern and western Punjab. It is confined to the plains and appears to be a local migrant. It inhabits large marshy tanks and *jheels* with ready margins and plenty of trees in the vicinity. Breeding season June to September.

Community

An association of organisms, living naturally in the same area and whose members are in varying degree interdependent, *e.g.*, ants.

Concept of infinity

An erroneous belief that natural resources are inexhaustible.

Conservation

Planned management and wise use of *natural resources, so as to prevent over exploitation, destruction or neglect, *e.g.*, wild life conservation. NOTE. Originally the term was used to denote strict preservation, leading to locking up of resources and prevention of their use. This meaning has become antiquated. In a broader sense, conservation implies the field of knowledge concerned with the coordination and practical application of data from the sciences, with a view to increasing and sustaining the availability of natural resources.

Conservation, water

The saving of water for beneficial use (1) through encouraging its absorption into the soil at or near the place on which it falls, (2) through impounding water which would otherwise be wasted, or (3) through reducing water losses from evaporation and transpiration.

Conservationist

One who advocates conservation, especially of natural resources (as forests, wild life).

Control (Entom.)

Check on the increase of population of an insect, brought about by a single factor or a combination of factors. Control can be classed as *natural control*, i.e., the reduction in the reproductive rate of the species, caused by the natural factors of the environment; or as *artificial control*, i.e., the reduction in the reproductive rate of the species caused by the intervention of men. Various methods of insect control are given below.

BIOLOGICAL. Control through utilization of parasites, predators, diseases, etc.

BIOTIC. Control through disease-producing organisms, such as *fungi, *bacteria, insect parasites and predators, birds, lizards, etc.

CHEMICAL. Control obtained through use of *insecticides, stomach-poisons, contact-poisons, repellants, attractants, and impregnation or other preservative treatments.

CLIMATIC. Control exercised by meteorological factors, such as temperature, rainfall, atmospheric humidity, wind, sunshine, light, etc., and by topographical features and zoogeographical distribution.

MECHANICAL. Control secured through barriers, screens, deterrents, traps, sun-heating, charring, etc.

NUTRITIONAL. Control brought about by regulating quality of food-supply, alternative food plants, host resistance, quantity of food-supply, etc.

SILVICULTURAL. Control secured through judicious silvicultural operations such as maintenance of natural forest, choice of silvicultural system, composition of mixed stands, thinnings, etc.

NOTE. Climatic, nutritional and biotic controls come under natural control. The others constitute artificial control.

Control (Pathology)

The regulation and more especially the limitation of plant or *virus populations by one or more factors; these may be natural (e.g., climatic, nutritional, *parasites) or artificial (i.e., through human agency)—indirectly by, e.g., silvicultural practices or directly by mechanical, chemical or biological means. See *Control (Entom.)*.

Control, artificial (Entom.)

Regulation of the numbers of a pest population to a level below which the damage done by it is financially unimportant, through the intervention of man. Biological, chemical,

Control, artificial (Entom.)—contd.

mechanical, and silvicultural control measures come under this category. Cf. *Control, natural*. See *Control*.

Control, biological

Control of plants, diseases, and animal pests by the use of natural enemies. (b) The employment of the enemies, and diseases of pest for the purpose of maintaining adequate control. The artificial application of biotic control.

Control, natural (Entom.)

Nature's method of maintaining a biotic balance as in the reduction of pest populations, caused by the natural factors of the environment. Climatic, biotic and nutritional control methods come under this category. Cf. *Control, artificial*. See *Control*.

Conversion cycle

A cycle of energy transfer, from plant-eating animals which obtain their energy from plants, pass them on through meat-eaters to the top predators, who on decay supply organic matter for plant life, thus completing the cycle. See *Food chain*.

Coot

Any of certain sluggish slow-flying, slaty-black, swimming and diving birds, resembling ducks and belonging to the genus *Fulica* of the family *Rallidae*. They have lobed toes; the upper mandible is prolonged on the forehead as a horny frontal shield.

COMMON COOT. (*F. atra*). Web-footed bird, inhabiting edges of lakes and still rivers, with base of bill extended to form a white plate on the forehead. In India, it is found wherever suitable water occurs. It ascends the Himalayas up to about 1,800 or 2,400 m. It is a resident species in many parts of India, but in winter its numbers are greatly increased by immigration. Sportsmen do not usually trouble to shoot it, as it is easy to hit and the flesh is not very tasty; but native fishermen net it or catch it by hand for sale in the markets.

PURPLE COOT. (*Porphyrio poliocephalus*). This is a large blue and purple bird with ungainly legs and feet. It is found in Kashmir, as a resident bird.

Cormorant

Any of various large, lustrous black, voracious sea birds of the genus *Phalacrocorax* (Family *Phalacrocoracidae*) that have a long neck, stiff wedge-shaped tail and slender hooked beak. They are found in most tropical and temperate sea-coasts of the world. The bird has a pouch of skin under the beak, into which it puts fish. It is a strong swimmer and diver, flies excellently and lives entirely

Cormorant—contd.

on fish. NOTE. In China and Japan cormorants have been trained to catch fish and bring them to their owners.

LITTLE CORMORANT. (*P. niger*). This is found throughout India excluding the Himalayas. It is the commonest species of cormorant and is often very abundant. It is fond of fresh-water, preferring marshes and tanks to rivers. Out of water, its favourite perch is a low stump sticking out of water. It is a resident bird, breeding in July to September.

LARGE CORMORANT. (*Phalacrocorax carbo*). This is black and of the size of the domestic duck. It is found in association with the little cormorant.

INTERMEDIATE. (*Phalacrocorax fuscicollis*). Found in association with the little cormorant, but rarer.

Cover

- (1) A place of natural shelter or vegetation which serves as shelter for birds, animals and fishes (especially when sought as game) from the adverse effects of excessive sunlight, drying and predators. NOTE. Game birds have been successfully developed by suitable cover crops along field borders and forest edges. Cf. *Covert*. (2) The factors that provide natural shelter and protection for wild animals are: suitable arrangements of vegetation, denning sites or rock formations, plants and their residues covering the ground and retarding run off and erosion of soil, etc.

Covert (Hunting)

A geographical unit of game cover, giving shelter to wild animals or game. Cf. *Cover*.

Covey

A small flock or a number of birds of the same kind, typically of partridges and certain related birds.

Crane

A small flock or a number of birds of the family *Gruidae* (Order *Guriformis*); superficially resembling *herons, but usually larger. They have very long legs, neck and bill.

COMMON CRANE (*Grus grus*). A winter visitor to India in enormous numbers (October to March). Considered very good for eating.

DEMOISELLE CRANE (*Anthropoides virgo*). A winter visitor to India in enormous numbers (October to March). Considered good for eating. This bird is rather small in size with long flowing secondaries and breast feathers and white plumes behind the eyes.

SARUS CRANE (*Grus antigone* Syn. *Antigone antigone* or *Megalornis antigone*). A huge bird with a reddish naked head and long legs, found in pairs about marshy places. It

Crane—contd.

is always bold in demeanour, always frequenting the same place. It is found throughout northern India. There are two forms. The typical form is seen in Uttar Pradesh, upper Bengal and Punjab south of the Chenab. The birds pair for life and are devoted and close companions. They are found in pairs in every *jheel* and tank of importance in its habitat.

Crepuscular

Relating to or like twilight. Applied to animals which appear or become active in twilight.

Crocodile

A large thick-skinned, long-bodied, aquatic reptile of tropical and sub-tropical waters, belonging to genus *Crocodylus* and related genera. Species found in India are *Crocodylus porosus* (which does not hesitate to attack man) and *C. palustris*.

Cruising radius

The distance an animal may move from an initial point (as a den) in the course of a day. NOTE. This is the maximum distance between locations at which an individual animal is found at different times of the day, or at various seasons in the year. See *Mobility*.

Cryptic coloration

Coloration which conceals animals by resemblance to their natural surroundings, especially by the pattern or colouring of the animals.

Cycle

An interval of time during which one sequence of a regularly recurring succession of events or phenomena is completed. See *Life cycle*.

D**Deer**

Any animal of family *Cervidae* comprising ruminant mammals with deciduous solid horns or antlers (usually in the male only). They have two large and two small hoofs on each foot. They are represented by numerous species and individuals in most regions except Africa and Australia. They form an important source of food for man and the larger carnivora. Types of Indian deer include:

BARKING DEER OR MUNTJAC (*Muntiacus muntjac*). See *Muntjac*.

BROW-ANTLERED DEER (*Cervus eldi* Syn. *Panolia eldi*.) The animal is so called because the brow tines of its antlers sweep forwards and the beams backwards in a continuous graceful curve. Found in swampy areas in the south-west corner of Logtak lake in Manipur. Two other sub-species are reported

Deer—contd.

in Burma and in Thailand. The animal is threatened with extinction and so is given special protection in its only habitat in Keibul Lamjao Sanctuary in Manipur. The race found in India is known as *Cervus eldi eldi*. Two other races are found in Burma and Siam.

CHITAL: SPOTTED DEER. (*Axis axis* Syn. *Cervus axis*). It is the most beautiful of all deer, with its coat of bright rufous fawn, profusely spotted with white at all ages and in all seasons. It is found in the forests at the base of the Himalayas, extending southwards to Kanyakumari, wherever there is jungle combined with good grazing and plentiful supply of water. It is unknown in the arid zone of the Punjab and Rajasthan. A well-built stag stands 0.9 m at the shoulder and weighs about 86 kilograms.

CHEVROTAIN OR MOUSE DEER. See *Chevrotain*.

HOG DEER. (*Axis porcinus* Syn. *Cervus porcinus*; *Hyelaphus porcinus*). An animal, with a pig-like appearance and movements, closely related to the chital. It is found in the low alluvial grass plains of North India from the Punjab to Assam.

KASHMIR STAG: HANGUL (*Cervus hanglu*). See *Hangul*.

MUSK DEER. (*Moschus moschiferus*). A small, hornless animal of Central Asia, the male of which secretes musk. The males carry no antlers, but have peculiar tusks, which are elongated upper canine teeth. The musk is secreted in a glandular sac under the skin of the abdomen of the male. It has a strong odour and is largely used in perfumery. The animal is much persecuted for its musk pod and is threatened with extinction. It therefore needs special protection. In India it is found in Kashmir at high elevations (example, Upper Dachigam).

RAVINE OR INDIAN GAZELLE: CHINKARA. (*Gazella bennetti*). See *Chinkara*.

SAMBAR: SAMBUR: SAMBHAR: SAMBHUR. Plural Sambars: Sambar: etc. (*Rusa unicolor* Syn. *Cervus unicolor*). A medium to large deer with a mane and three-pointed antlers, found in south-eastern Asia and many of the Indo-Australian Islands. The Indian race is *Rusa unicolor nigra*, and it is found in wooded districts of India. The Malay race *Rusa unicolor equinus* is found from Assam eastwards.

SWAMP DEER: BARASINGHA. (*Cervus duvaucelli* Syn. *Rucervus duvaucelli*). A brown or yellowish-brown deer, found only in India. A good stag measures 1.35 m at the shoulder, weighing about 175 kilograms. The horns have 10 to 14 tines, hence the name *Barasingha*. It is found in the *tarai* of Uttar

Deer—contd.

Pradesh, Assam, Sunderbans and Madhya Pradesh. In the *tarai* it lives in marshland and is seldom out of water. In Madhya Pradesh it lives in grassy maidans.

Den

A retired place, such as a cave, serving as the habitation of a beast or as a place of shelter, concealment, etc.

Den trees. (Wild Life)

Large hollow trees which serve as dens for den-users like squirrels, wild cats, owls, etc. Den trees are of critical importance to some species of animals.

Density (Wild Life)

(a) As applied to wild life, the number of individuals per unit of space (as area, or volume as a population of 100 per sq. mile). The optimum density range is that within which an animal community is able to fluctuate without being subject to the ill effects of over-or under-crowding. (b) Also applied to vegetative cover.

Desert

A barren uninhabited land of large extent. It may be cold (e.g., the Arctic and the Antarctic) or hot (e.g., the Sahara). Cold deserts are due to low temperature appropriate to the latitude. Hot deserts are due to excess of evaporation over precipitation.

Diapause

A period of spontaneous dormancy interrupting developmental activity in larva or pupa, or arresting reproductive activity in an adult insect. This state is independent of environmental conditions. Cf. *Hibernation*.

Didermocerus sumatrensis (Sumatran or Asiatic two horned rhinoceros).

See *Rhinoceros*.

Dimorphism (Zool.)

The occurrence of two forms distinct in structure, coloration, etc., among animals of the same species.

Dimorphism (Bot.)

The occurrence of two different forms of flowers, leaves, etc., on the same plant or on distinct plants of the same species.

Dog

Dogs are carnivorous quadrupeds of the genus *Canis*, found wild in various parts of the world and domesticated in all countries, in numerous races or breeds, varying greatly in shape, size, and colour. The Indian wild dog *Cuon alpinus* is a *predator of several kinds of deer and helps in keeping the *balance of nature.

Dove

Any of numerous birds of the family *Columbidae*. See *Pigeon*.

INDIAN RING DOVE (*Streptopelia deccoto*). This is a pale grey and brown dove with a plain black collar or ring round the base of the neck. This is the commonest dove of India, found everywhere in open country. It ascends the Himalayas up to 3,300 m. While mainly a resident species, it is locally a migrant.

SPOTTED DOVE (*S. chinensis*). This is recognised by the brown and grey upper parts, conspicuously spotted. It is found throughout the greater part of India. Several forms are known. It is a resident bird with slight local movements.

EMERALD DOVE (*Chalcophaps indica*). Slightly larger than a mynah. Found in Western Ghats, sub-Himalayan tracts from Kumaon to Assam, eastern Madhya Pradesh and Eastern Ghats.

LITTLE BROWN DOVE. (*S. senegalensis*). Found in parts of peninsular India. A resident species.

RED TURTLE DOVE (*Oenopopelia tranquebarica*). The only Indian dove in which the sexes appear different. Widely distributed in India. A resident species.

RUFUS-TURTLE DOVE (*S. orientalis*). A large vinous-brown dove with conspicuous rufous scale markings. Two forms found in India. One form is resident while the other migrates from the hills to the plains in winter.

Drive (Vb).

In hunting, to chase (game) from thickets into the clear or into nets, traps, etc. See *Hunting* (BEATING).

Duck

Any of the various swimming birds of the family *Anatidae* (Order *Anseres*), which have short neck, short legs, webbed feet, and a depressed and expanded beak. The sexes are almost always different from each other in plumage. These characteristics and their small size distinguish them from *swans and *geese which also belong to the same family. They are more or less aquatic and most are powerful flyers. They are found all over the world, living mostly in fresh-water (rivers and *jheels*), but to a lesser extent in brackish waters.

Thirty-eight species of wild duck (including teals) are recorded in India. Twenty-nine are winter visitors and nine are resident species. Most common species abundantly caught for food are the following. They constitute the sportsman's favourites.

Duck—contd.

COMMON TEAL. (*Anas crecca*). A very small duck, distinguished from other Indian species by the conspicuous emerald green and black speculum and the pale cinnamon bar on the coverts. Found all over India in winter.

GARGANEY OR BLUE-WINGED TEAL (*Anas querquedula*). It is found throughout India in winter. It is most commonly and abundantly netted for food.

WHITE-EYED POCHARD. See *Pochard*.

COMMON POCHARD. See *Pochard*.

PINTAIL (*Anas acuta*). See *Pintail*.

GADWALL (*Anas strepera*). A large duck. Most abundant winter visitor from October to April in Northern India.

WIGEON: WIDGEON. A Duck with a relatively small beak, widest at the base. Genus *Anas*. See *Wigeon*.

SHOVELLER. A widely distributed duck *Spatula clypeata* of the northern hemisphere. It derives its name from the greatly broadened beak. In winter it is found throughout India (October-April), common in the north, scarcer in the south.

SPOTBILL DUCK. (*Anas poecilorhyncha*). This is a duck distinguished by the bright red spots at the base of the beak. It occurs in most parts of India, usually keeping to itself and not associating with other ducks. It is a resident bird, though locally migratory in places. It is a good bird for the table, though from the sporting point of view, it is less interesting than many other ducks.

E

Eagle

Any of a number of large, strong, flesh-eating *birds of prey, (genus *Aquila*), belonging to the falcon family *Falconidae*, noted for their strong hooked beaks, large curved claws, sharp vision and powerful wings equipped for speedy flight.

TAWNY EAGLE (*Aquila rapax*). A large brown or blackish brown bird of rather fierce appearance. It sits heavily on tops of trees or soars in great circles. The form found in India is the Oriental race of *A. rapax* called *A. rapax vindhiana*. It is found throughout most of India except in the Malabar coast. In the Himalayas it is found up to 1,200 m. It is a resident species.

Ecology

A branch of science concerned with the inter-relationship of organisms and their environment, especially as manifested by natural cycles, and rhythms, community development

Ecology—contd.

and structure, interaction between different kinds of organisms, geographic distributions, and population alterations. See *Autecology*, *Synecology*.

Ecotone

A junction of two or more vegetation types. It is a transition area between two adjacent ecological communities (as forest and grassland). NOTE. There is competition between animals common to both.

Ectoparasite

A *parasite that lives on the outer surface of an animal, opposed to *Endoparasite*.

Edaphic

(Applied to ecological formations). Resulting from or influenced by factors inherent in the soil (as salinity, alkalinity, drainage, etc.), as opposed to *climatic*. See *Climax*, *edaphic*.

Edge effect

The result of the presence of two adjoining plant communities (as in an *ecotone), on the numbers and kinds of animals present in the immediate vicinity. NOTE. Wild life uses interior of the forest less than the margins; where maximum wild life utilization occurs. Small openings increase the edge effect.

Edible game birds

Strictly speaking, all birds are edible since there are none with poisonous flesh. Birds which feed on carrion are not usually eaten. See *Bird*, *Game birds*.

Efflux (Wild Life)

That which flows out. Applied to game which moves out of an area. Syn. *Outflow*.

Egret

Any of various *herons (genus *Egretta*), that bear long, white beautiful plumes on the lower back known as aigrettes, during the breeding season and commonly have pure white plumage. Syn. Lesser white heron. See *Snowy Egret*. It was once threatened with extinction, but is now adequately protected. Egrets found in India include:

LITTLE EGRET (*Egretta garzetta*). This is a long-necked, long-legged white bird found in parties about the neighbourhood of water. It is distinguished easily by the black beak at all seasons and the two long crest plumes in breeding plumage. It is found throughout the plains of India.

CATTLE EGRET (*Bubulcus ibis*). Parties usually attend on grazing cattle. Found throughout India.

Elephant

Huge, four-footed, thick-skinned, five-toed mammal, with long curving ivory tusks and a long prehensile trunk or proboscis, belonging to the family *Elephantidae*. Only two species now exist: the Indian elephant (*Elephas indicus* Syn. *E. maximus*) with comparatively small ears and the African elephant (*Loxodonta africanus*) with large flapping ears. The former is, now at any rate, an inhabitant of the hills; in the forests of Madras, Kerala, Mysore, Orissa and in the *tarai* forests of Uttar Pradesh, Bengal and Assam. The maximum height is 3.6 m (12 feet). Laws regulate its protection. The killing of rogue elephants has to be specifically licensed. Tame elephants are extensively employed in India and Burma for dragging timber in forest areas.

Endemic

Peculiar to a locality or region — often used of a disease that is constantly present to a greater or less extent in a particular place.

Environment

The surrounding conditions, influences, or forces that affect or modify the whole complex of climatic, edaphic and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival. Cf. *Habitat*. Often contrasted with *heredity.

Environmental factors

The whole complex of climatic, edaphic and biotic factors that act upon an organism or an ecological community and ultimately determine its growth and survival. These can be classified as:

DECIMATING FACTORS: Accidents, starvation, enemies, etc. which tend to destroy a population.

WELFARE FACTORS. Abundant food supply, shelter, etc. which tend to benefit the species. NOTE. Absence of a welfare factor usually means the presence of a decimating factor, as when shortage of food supply threatens death by starvation.

Environmental resistance

The sum of the environmental factors (as drought, mineral deficiencies, competition) that tend to restrict the biotic potential of an organism or kind of organism and impose a limit on numerical increase.

Equilibrium

A state, often theoretical in which inanimate and animate life are balanced in nature. See *Balance of nature*.

Equus hemionus khur

See under *Ass.*

Erosion (Geol.)

The process by which the surface of the earth is worn away by the action of water, glaciers, winds, waves, etc. NOTE. The land surface becomes lowered as a result of weathering, corrosion and transportation, under the influence of gravity, wind, running water, action of sea, etc. Soil erosion may result from external factors such as bad agricultural practices, deforestation, overgrazing. Various types of erosion are distinguished:

ACCELERATED. Abnormal or rapid erosion in an environment disturbed by animal life, chiefly man, and due primarily to such disturbance.

GULLY. A form of erosion, caused by water, in which gullies are produced.

RILL. A form of erosion, caused by water in which very small, numerous, more or less straight channels of an impermanent nature are produced.

SHEET. Erosion of a fairly uniform layer of material from a land surface, often scarcely perceptible, especially when caused by wind.

Erosion cycle

The successive stages through which a newly uplifted land mass must pass before it is worn down to a peneplain or a surface near sea level including (1) juvenile stages, (2) mature stages, and (3) old-age stages wherein the land is so worn down that the streams meander sluggishly across a lowland.

Escape-covert

A *covert serving as refuge from predator attack, by reason of density or mechanical protection.

Estivation; Aestivation (Zool.)

The process of passing a summer, a hot season or a period of prolonged drought in a torpid condition. Cf. *Hibernation.*

Estuary

The lowest broadening part of a river where salt-and-fresh-water mix, often providing particularly good fishing.

Eurythermous

Of animals able to tolerate a wide range of environmental temperature.

Exotic

A plant or animal of foreign origin, introduced in a region but not fully naturalised or acclimatized. Not native or indigenous.

Exploit (V)

To remove and utilize.

Extinction threshold

The minimum number in a population of a particular species of animals, below which the population numbers are too few for rebuilding the species and so extinction results.

F**Factor (Wild Life).**

One of the forces reducing the numbers (decimating factors) or affecting the increase rate (welfare factors) of game.

Falcon

A small diurnal *bird of prey related to *hawks and *eagles, with short, curved beak and powerful hook-shaped claws, found throughout the world. Especially one trained to pursuit of other birds or game; usually the peregrine (*Falco peregrinus*), which is widely used for catching game and other birds, is not found in India.

LAGGAR FALCON (*Falco jugger*) is the bird found in India from about 750 m of the Himalayas southwards up to southern Madras. It is a strictly resident species.

Falconry (Hawking).

The art of training falcons to pursue and to attack wild fowl or game birds. It is a sport practised in India to a certain extent.

Family

Grouping of related genera used in *classification of plants and animals. Names of plant families usual end in — *aceae*, e.g., *Rubiaceae*. Animal families end in *idae*, e.g., *Homididae*.

Fauna

The animals of a given region or period, taken collectively (as distinguished from the plants or *flora*). NOTE. The Indian Board for Wild Life had, in 1952, issued a list of thirteen rare fauna, which are threatened with extinction and which should therefore be given special protection. These are: Indian lion; snow leopard; clouded leopard; cheetah; rhinoceros; Indian wild ass; Kashmir stag; musk deer; brow-antlered deer; pygmy hog; great Indian bustard; pink-headed duck; and white-winged wood duck.

Felis bengalensis

See *Cat* (LEOPARD CAT).

Felis caracal

See *Caracal*.

Felis chaus

See *Cat* (INDIAN JUNGLE CAT).

Felis marmorata

See *Cat* (MARBLED CAT).

Felis rubiginosa

See *Cat* (RUSTY-SPOTTED CAT).

Felis temmincki

See *Cat* (GOLDEN CAT).

Felis viverrina

See *Cat* (FISHING CAT).

Fish

A class of vertebrate, cold-blooded, strictly aquatic animals having gills throughout life and with limbs modified into fins. They are important to man, especially as a source of food, fertilisers, oils etc. Angling is a favourite sport. NOTE. Among the edible fishes of India the carp (*Cyprinidae*) and the catfish (*Siluroidea*) are most important. From the angler's point of view, by far the finest fish is the mahseer (*Barbus mosal*), a species of barbel. This is found in most hill streams from the Punjab to Assam and in the south. One of the richest and most delicious of Indian dishes is the hilsa (*Clupea ilisha*).

Flamingo (Plural *Flamingos*: *Flamingoes*).

Any of the various aquatic birds of the family *Phoenicopteridae* that have remarkably long legs and neck, webbed feet, a broad bill resembling that of a duck but abruptly bent downward. Usually it has rosy-white plumage. It is gregarious, breeding in colonies in swamps and shallow lagoons. The common flamingo of India, *Phoenicopterus roseus* is found capriciously throughout India. It is common in the Great Rann of Kutch.

Flight limit

The maximum distance a bird can traverse at one continuous flight.

Flight shooting

Shooting wild fowl during the morning and evening flights to and from their feeding or resting grounds.

Float

Device for carrying shotted tackle to where fish are expected to signal *bite.

Florican, Lesser (*Sypheotides indica*).

This is a small long-legged *bustard, found chiefly in grassy plains, with a curious habit of jumping into the air. It is confined to India. Its habitat lies on the drier portions of the peninsula lying west of the Western Ghats and east of the Godavari.

Flyway

A geographic course along which birds customarily migrate between breeding and wintering area. Generally, such a migration route together with the breeding and wintering areas that it connects.

Food chain (*Ecol.*)

A series of organisms (such as animals) in a community inter-related in their feeding habits, the smallest being fed upon by a larger one, which in turn feeds a still larger one, and so on. The chain is based on a herbivorous species. Plants form the ultimate basis of the chain. The term furnishes a convenient method of denoting food relationship in a natural *community.

Food conservation

The rate at which an animal converts food into tissue, usually expressed as kilograms of food consumed per kilogram of live weight gained.

Food cycle

A group of food chains constituting all or a significant part of the food relations that enable survival of the population of a community.

Food-gatherer

A person who lives upon food procured by hunting, fishing, and gathering rather than through agriculture or animal husbandry.

Forest village

A village community established inside a reserved forest or protected forest, usually for the supply of labour for the execution of forest works.

Fowl

Any of several domesticated or wild gallinaeous birds.

RED JUNGLE FOWL. (*Gallus gallus*). A resident species, found in North India, almost everywhere in hills and jungles.

GREY JUNGLE FOWL. (*G. sonneratti*). This has a strong resemblance in both sexes to domestic fowls. The grey streaked plumage of the male combined with the glossy black tail is distinctive. It is purely an Indian species found in Western and Southern India in hilly and jungle ground. It is a resident species found up to the summit of the hills, extending southwards to Cape Kanyakumari. In northern India it is replaced by *Gallus gallus*, considered as the ancestor of domestic fowls.

Fox

Any of certain carnivores of the dog family (*Canidae*), especially those constituting the genus *Vulpes*. They are smaller than the wolves and are characterised by elongated pointed muzzle, erect ears, red fur and long bushy tail. NOTE. They are proverbial for cunning and are preserved in England and elsewhere as beasts of chase. Fox-hunting is an acknowledged *sport.

Fox—contd.

INDIAN FOX (*Vulpes bengalensis*). This is the common fox of the plains, slightly smaller than the red fox, with a distinctive black tip to its tail. It is found throughout India.

RED FOX (*Vulpes vulpes*). This is a richly coloured fox with long silky fur and a superb brush. Length of head and body, 66 cm (2'—2"). Tail with hairs 48 cm (19"). It is found in Ladakh, Kashmir.

G**Gadwall** (*Anas strepera*)

A greyish-brown dabbling duck of about the same size as a *mallard. A winter visitor. One of the commonest and locally abundant migratory wild fowls.

Gallus gallus

See *Fowl* (RED JUNGLE).

Gallus sonneratii

See *Fowl* (GREY JUNGLE).

Game

Those species of animals, birds, etc., which are hunted or shot, either for trophies, or for their meat, or for sport, or for a combination of any of these. Two types are usually distinguished:

BIG GAME. Large animals (e.g., tiger, panther, deer) sought or taken during hunting for pleasure and sport.

SMALL GAME. *Game birds and mammals not classified as big game such as hares, rabbits, foxes.

Game animal

An animal, which is a legitimate quarry by State or other law.

Game birds

Those which are legitimate quarries by State or other law. True game birds are, recognised as those belonging to the Order *Gallinae*, but the term in ordinary usage includes many others, such as pigeons, sandgrouse, hemipodes and also some water-birds. All of them conform to the sportsman's standard that "they are good to eat and difficult to shoot." In North America the term 'game birds' includes the so-called upland game birds (Gallinaceous or chicken like birds) such as quail, pheasant, grouse and partridge; aquatic game birds such, as ducks, geese and swans; and the shore birds—woodcock, snipe and plover. In Great Britain the term is said to apply only to the grouse, pheasant and partridge. See *Bird*.

Game fish

An edible fish, capable of affording sport to the angler in its capture.

Game laws

Laws enacted for preservation of game. Species and the size and sex of animals that can be taken are defined by law, as also the manner of taking; periods of *close season are established to provide protection during the reproductive period. The open season is restricted and regulated in a suitable way so as to ensure adequate replenishment of game. See *Closed*.

Game management

Administering game laws, defining and enforcing close seasons. See *Game laws*. Cf. *Wild Life management*. Game management is the art of making the land, forests, etc. produce wild game in sufficient numbers to permit harvest for recreational purposes.

Game survey

An extensive type of wild life inventory, involving a general survey of existing species, their history, their present condition and the environmental factors influencing them.

Gaur

Indian Bison (*Bibos gaurus* Syn. *Bos gaurus*).
See *Bison*.

Gazella bennetti (Syn. *Gazella gazella*).

See *Chinkara*.

Gazelle, Indian

See *Chinkara*.

Goose

Any of numerous, large, swimming birds forming a distinct sub-family *Anserinae* of the family *Anatidae*. They are somewhat intermediate between *swans and *ducks; they differ from ducks in that the sexes are alike in plumage and the male assists the female in hatching the egg. They are monogamous and mate for life. They have compressed bills, legs of moderate length and usually larger and longer necks than ducks. Geese are excellent *game birds and good food. Out of 7 migratory species found in India, two are important, being largely netted for sale. They are:

GREY LAG GOOSE. (*Anser anser rubrirostris*). It keeps mostly to the larger *jheels* in northern and north-western India.

BAR-HEADED GOOSE. (*Anser indicus*). A typical goose, grey-brown and white in colour and characterised by two dark bars on the back of the head. Hence its name. It breeds in Central Asia and for winter it moves south to India in October and leaves in March.

Goral

Any Asiatic animal, like the chamois of Europe, related to the goats and the antelopes.

Goral—contd.

Scientific name *Nemorhadus goral*, also spelt *Nemorhadus goral*. It has small horns, shorter than the distance apart at the base. Three species or perhaps mere races, of goral are found in India. These are:

BROWN GORAL (*Nemorhadus hodgsoni* Syn. *N. goral hodgsoni*). This is found in Nepal and Sikkim.

BURMESE GORAL. (*N. griseus*). This is found in Assam, Burma, Tibet and eastern China.

GREY HIMALAYAN GORAL. (*N. goral goral*). Found in Kashmir and the Western Himalayas.

Grassland (Bot.)

An area in which the natural vegetation consists almost entirely of perennial grasses, whereas trees are either limited to stream courses or are widely distributed. NOTE. This type of land is characteristic of sub-humid and semi-arid climates.

Grassland climax (Bot.)

A *climax community consisting of *grassland.

Gregariousness

The quality of being gregarious. Many animals show instinctive or temperamental preference for a social rather than a solitary existence. NOTE. Burrowing rodents, wild dogs, ground squirrels, elephants, deer, are examples of gregariousness. Flocking habits reflect gregariousness in birds.

Guano

Natural manure, composed chiefly of the excrement of sea birds, found especially on the islands near the Peruvian coast. NOTE. It is rich in phosphates and nitrogenous matter and hence used as a fertiliser.

H

Habitat

The kind of place where a given plant or animal naturally grows or lives, as warm seas, mountain tops, fresh-waters, tropical jungles, etc.

Haliastur indus

See *Kite* (BRAHMINY).

Hand

A lineal measure used in giving the height of horses, asses, etc. It is equal to four inches (10 cm).

Hangul: Kashmir stag. (Cervus elaphus hanglu)

The Red Deer of Europe typifies a group of large deer consisting of several species and races distributed over Europe, Asia north of

Hangul—contd.

the Himalayas, North Africa and North America. Two or three species are found in India. Of these the Hangul is the commonest and best known. This is found in the north side of the valley of Kashmir and in some of the adjacent valleys. It is a forest animal found singly or in small parties. Its coat ranges from light to dark brown, fading to dingy white on the lips, chin, underparts and buttocks. Fawns are spotted. The fine, spreading antlers assume great variety in form. Normal heads have fine points on each antler. Reputed to number about 2,000 in 1947, there were hardly 175 in August, 1962. It is one of the thirteen rare animals of India, on the verge of extinction. It is protected in Dachigam sanctuary.

Harassment

Interference by predators with the normal movements, activities and actions of game.

Hare

Any of a large group of swift animals (genus *Lepus*; family *Leporidae*) of the rodent family, with long ears, soft fur, a cleft upper lip, a short tail and long powerful hind legs, adapted for leaping. It resembles a rabbit, but is larger.

COMMON HARE. (*Lepus nigricollis ruficaudatus*). Found from the Himalayas downwards to the Godavari river, except in the desert zone.

DESERT HARE. (*Lepus nigricollis dayanus*). Found in the arid zone of the Punjab, Rajasthan and Kathiawar.

BLACK-NAPED HARE. (*Lepus nigricollis nigricollis*). This is distinctive in having a dark brown or black patch on the back of its neck from its ears to shoulders. It is found in South India extending northwards up to Khandesh in the west and the Godavari river in the east.

Hawk

Any of a family of diurnal birds of prey (family *Falconidae*), characterised by short, rounded wings, a long tail and legs, a hooked beak and large, curved claws. NOTE. Hawks include the *falcons, buzzards, *kites. Very large hawks are known as *eagles and vultures. Formerly used in falconry. Zoologically restricted to a bird of the sub-family *Accipitrinae* which includes the sparrow hawk and the goshawk, with rounded and shortish wings and low flight. Indian species are:

SHIKRA (*Accipiter badius* Syn. *Astur badius*). A small Indian hawk, found throughout the Indian Union and up to 1,500 m in the Himalayas. It is a favourite bird in falconry, as it is easily trained.

Hawk—contd.

SPARROW HAWK. (*Accipiter nisus*). Distributed almost throughout India.

Hedgehog

An insectivorous mammal of genus *Erinaceus*, and related genera, frequenting hedges and gardens and having spiny hairs on the back and sides. It has a pig-like snout, hence its name. It is armed with very many spines and is able to roll itself into a ball, with these bristling in every direction. NOTE. This should not be confused with the porcupine. Indian species are:

HARDWICKE'S HEDGEHOG. (*Hemiechinus collaris*). Found in the dry desert zone of Kutch, Rajasthan and Western Punjab, and the neighbouring tracts.

PALE HEDGEHOG. (*Paraechinus micropus*). This is also found in the dry desert zone.

Hemitragus hylocrius

See *Tahr*.

Hemitragus jemlahicus

See *Tahr*.

Herd

Any large aggregation, or detached unit, of hoofed mammals.

Heredity (Biol.)

The transmission from parent to offspring of certain characteristics. For this reason there is a tendency for offspring to resemble parents and ancestors.

Heron (also Hern).

Any of various wading birds of the genus *Ardea* (family *Ardeidae*) with a long neck and long legs, long tapering bill with a sharp point and sharp cutting edges, large wings and soft plumage. They live in the vicinity of marshes and river banks, feeding mostly on aquatic animals and fish. They nest in trees, often in communities. Cf. *Egret*.

Herons found in India are given below:

COMMON OR GREY HERON (*Ardea cinerea*). A tall grey bird marked with black and white, recognised in flight by the slow flapping of the wings and the long legs projecting behind. In India it is a resident bird in the plains and the hills up to 1,500 m. It is essentially a solitary bird though gregarious in the nesting season.

NIGHT HERON (*Nycticorax nycticorax*). Various nocturnal and *crepuscular *herons of *Nycticorax* and related genera found in temperate and tropical regions. *N. nycticorax* is a small heavy heron, sleeping by day in thick trees. Typically it is found in Europe, Africa and parts of Asia. In India it is very general, being found throughout the plains and in the North West Himalayas up to 1,500 or 1,800 m. It is in the main a

Heron—contd.

resident species, though locally migratory. POND HERON: PADDY-BIRD (*Ardeola grayii*). It is one of the commonest of its family in India. It is small and is found in every piece of water, escaping notice by its dingy coloration. It ascends the hills up to 1,200 m. It is chiefly a resident species, though locally migratory.

PURPLE HERON (*Ardea purpurea*). Chiefly greyish with black crown and maroon breast.

Hibernation

Dormancy or period of suspended activity during winter, common among mammals, reptiles and many vertebrates of temperate and arctic climates. Cf. *Aestivation* which is a sleep like condition of suspended activity for passing dry periods. See *Aestivation*; *Diapause*.

High (N).

The peak of a *cycle. A period of abundance.

Hilsa

A valuable *anadromous herring (*Clupea ilisha*). It resembles a shad.

Hog

An omnivorous non-ruminant mammal of the family *Suidae*, sub-order **Artiodactyla* and order *Ungulata*. The pygmy hog, *Sus salvanius*, said to have been once found all along the base of the Himalayan foot-hills is now feared to be nearly extinct. It is one of the thirteen animals requiring special protection. It is similar to its larger cousin, but even the adults never grow bigger than 25 cm (10 in.) high at the shoulder.

Holotype

The single specimen designated by an author as the type of a species. Cf. *Lectotype*.

Home range

The area to which an animal confines its activities. It wanders in this area without excluding others. Cf. *Territory*. NOTE. Deer, rabbits and many rodents exhibit home range tendency.

Hook

Bent piece of wire used for catching fish. A poor hook renders meaningless the most sumptuous of other tackle. Types of hook include:

CRYSTAL. One commonly used in coarse fishing.

EYED. One with shank eyed at top so that the line can be directly tied to the hook.

LIP. One used for putting through lips of bait on spinning flight.

DOUBLE. One which has 2 bends, points and barbs originating from a common shank.

Hook—contd.

TREBLE. Same as above, but with 3 points and 3 barbs.

Hook order

Pattern of social organization found in a herd of cattle, similar to peck order found among birds. Any member of a herd has the right to hook (or make an attack with the horns) one of lower status without fear of retaliation and its tame submission to hooking by one of higher rank. See *Peck order*.

Humus

The dark or dark-brown organic material present in soil, produced by the decomposition of vegetable or animal matter, essential to fertility and favourable moisture supply. **NOTE.** The organic matter is decomposed to such an extent that it has lost all signs of its original texture. It is usually colloidal.

Hunting

The term denotes the seeking, pursuing and taking of game and wild animals for subsistence, profit or sport. In Great Britain and Western Europe hunting for sport is defined as the taking of any wild animals by the aid of hounds that hunt by nose. Elsewhere hunting refers to the field sport of shooting small and large *game. Big game hunting has always exercised great fascination for mankind. The pursuit of large game, often at considerable risk to the hunter, must be given the credit for driving many explorers into the unknown. See *Sportsman*. **NOTE.** In India the principal game fields are, (i) the sub-Himalayan tract extending eastwards from the Yamuna river to Assam, which holds the tiger, elephant, rhino, sloth bear, black (Himalayan) bear, sambhar, cheetah, etc.; (ii) the forests of central India (including parts of Madhya Pradesh and Andhra Pradesh), which abound in tiger, bison and sambhar; (iii) the dense forests of Madras, Kerala and Mysore where tiger, elephant, bison and deer are found; (iv) the Nilgiri hills where the ibex is found. The different methods of hunting are:

STALKING. This is a common method of hunting. In open country free from trees, game can be viewed from a distance. Under these conditions a slow and stealthy approach is necessary, use being made of every bush, rock mound, or tree as a means of concealment. Attention should also be paid to the direction of wind.

STILL-HUNTING. In dense bush or scrub it is impossible to see more than a few yards. One comes upon game suddenly and the best chance of getting a shot is to walk slowly and cautiously, ever on the alert.

TRACKING. Big animals that herd together (e.g. elephant and deer) cannot be stalked

Hunting—contd.

or still-hunted. They leave well-defined tracks on soft ground. A skilful hunter can follow their track even on hard ground.

BEATING. DRIVING. Some animals inhabit in or retire to a patch of dense jungle in which it is impossible for a man to advance silently within shooting distance. The only way to hunt such animals is to drive them out into the open or along some path where the sportsman is waiting. This is done with the help of a number of men with drums who form a line and advance into the jungle making a loud noise with the drums. When the animal comes out of its hiding place, the sportsman has a chance of shooting it.

SITTING UP IN A MACHAN. In the case of beasts of prey a half-eaten kill is dragged to a suitable place where the sportsman can hide and await the arrival of the animal. **NOTE.** Sitting up over a water-hole or salt-lick is not usually considered sportsman-like and such practices are prohibited by law in many localities.

CALLING. This form of hunting is practised in pursuit of deer. It consists of waiting in hiding and making noise in imitation of the call of a female during the rutting season. In such a case a male is likely to answer and come right up to the sportsman.

Hunting box

A hunting lodge.

Hunting ground

Place or area used for hunting, specifically a region in which game is hunted.

Hunting pressure

See *Pressure, hunting*.

Hyaena: Hyena

Any of a group of wolf-like, nocturnal carnivores of Africa and Asia, of the family *Hyaenidae*. They have a bristly mane, short hind legs, powerful jaws, neck and shoulders, but low and comparatively poorly developed hind quarters. They have a characteristic shrill cry. They feed chiefly on carrion and are considered cowardly. The common hyaena found in India, *Hyaena striata* (Syn. *H. hyaena*), the striped or laughing hyena, is about the size of a large dog. It is found wherever the wolf is absent and is equally destructive.

Hydrologic cycle

A complex sequence of conditions through which water naturally passes from water vapour in the atmosphere, through precipitation upon land or water surfaces and ultimately back into the atmosphere as a result of evaporation and transpiration.

I

Ibex. (Plural *Ibexes*, *Ibices*.)

Any of several species of wild goats (genus *Capra*) of Europe, Asia or Africa. The male has large, backward, curved horns, like scimitars. *Capra ibex*, of the Alps, is now rare there, being found now only in Mongolia and Abyssinia. Two species are found in India.

ASIATIC OR HIMALAYAN IBEX. (*Capra ibex sibirica*). Found at elevations above 3,600 m in the Himalayas, especially in Kashmir. About 1.07 m (3½ ft.) high at the shoulder.

NILGIRI IBEX. (*Hemitragus hylocrius*). Found in the more rocky hills of the Nilgiris and the high ranges of Kerala at elevations of about 2,500 m. This is a misnomer. This animal is a *tahr. See *Tahr* (NILGIRI TAHR).

Ibis. (Plural *Ibis* or *Ibises*.)

Any of several, long legged, wading birds related to the *herons, and constituting the family *Threskiornithidae*. They inhabit warm regions, feeding on aquatic amphibian animals. They are distinguished by a long, slender downwardly curved bill. NOTE. The sacred ibis of the Nile is well known.

WHITE IBIS. (*Threskiornis melanocephalus*). This is found throughout India as a resident species. It is found in inland waters, preferring large marshes and *jheels*.

BLACK IBIS. (*Pseudibis papillosa*). This is a large black bird, identified by the bare head and long curved beak. It perches on trees and feeds on the ground. It is found in the plains of India. It is a resident species.

Ibis leucocephalus

See *Stork* (PAINTED STORK).

Inbreeding

The interbreeding of closely related individuals occurring naturally (as in a closed population); as a result of social or religious custom (as in some royal families) or as a deliberately chosen system of breeding (as of cattle or poultry). NOTE. This serves to fix desirable characters of and to eliminate unfavourable characters from a suitably selected stock, but tending to effect an unwanted decline (as in size, vigour or fertility) through the fixation of undesirable and often recessive characters when the initial stock is in any way defective. Distinguished from *Outbreeding*. Cf. *Line breeding*.

Index

A condition which can be measured and which varies as some other condition which cannot be measured. The former is used as an index to the latter.

Index plant

A plant indicating the whereabouts of game or the suitability of a range for game.

Index species

A plant or animal species so highly adapted to a particular kind of environment that its presence is sufficient indication that a habitat under investigation belongs to the kind to which the species is adapted.

Indian darter: Snake bird (*Anhinga rufa* Syn. *A. melanogaster*).

These have long and slender S-shaped necks, narrow heads and dagger-like bills all streamline to enable them to swim underwater and spear their fishy prey. They feed their young in the same manner as do pelicans and cormorants. They swim, dive and fly well and perch on trees. They are resident species in India, being found in suitable localities. They do not ascend the hills. They frequent fresh-water (rivers, lakes and *jheels*).

Indicator

An organism or kind of organisms (as a species) or an ecological community that is so strictly associated with particular environmental conditions that its presence is indicative of the existence of these conditions in a particular environment. NOTE. It is a condition which is visible and which denotes some other condition which is invisible.

Inner sanctuary

See *Sanctum sanctorum*.

Interbreed

- (1) To breed together as in *cross-breed.
- (2) To breed within a closed population as in *Inbreed.

Inter-relationship (*Wild Life*)

Mutual relationship between different forms of animal and plant life to each other and to their *environment.

Interspersion (*Biol.*)

The intermingling of different kinds of organisms (species of plants or animals) within an ecological community (such as a forest, or a wild life population).

Inventory

An estimate or a survey of natural resources; specifically an estimate or enumeration of the wild life (as game animals) of a region. (American usage) Syn. *Census*.

Irruption

A large, sudden, non-periodic increase in density of a natural population often accom-

Irruption—contd.

panied by an extension into hitherto unoccupied range. Irruption is due to favourable alteration of the environment.

J

Jackal

Any of several races of wild dog of the genus *Canis*. *Canis aureus* is a yellowish-grey, meat-eating dog of Asia, and northern Africa, smaller than the wolf. It runs in packs and hunts its prey at night. It eats carrion and small animals, which are easy to kill, such as poultry and the sickly young of deer. Their warning note of the presence of a tiger or leopard is characteristic. It was formerly supposed to hunt up lion's prey for him.

Jungle-fowl, grey

See under *Fowl*.

Jungle-fowl, red

See under *Fowl*.

K

Kashmir stag

See *Hangul*.

Kheddah

A stockade or an enclosure, usually constructed of stout round logs, with an entrance gate, into which wild elephants are driven for the purpose of capture. The gate is dropped down after the entry of elephants. cf. *Pit method of capturing elephants*.

Kill

An animal or bird shot during hunting. Collectively the animals or birds shot in a hunt, during a season or in a particular period.

Kill-ratio

The proportion or percent of the game population which can be killed yearly without diminishing subsequent crops. The ratio of the yield to the population.

Kingfisher

Any of numerous non-passerine birds of family *Alcedinidae*. They are usually crested and bright-coloured, with a short tail, stout sharp bill, and weak syndactyl feet. Birds found in India are:

BLACK-CAPPED KINGFISHER. (*Halcyon pileata*). Found along the coast-line of India, south of Bombay.

BROWN-HEADED STORK-BILLED KINGFISHER. (*Ramphalcyon capensis*). Practically throughout India except the arid zone.

COMMON KINGFISHER. (*Alcedo atthis*). Found throughout India.

Kingfisher—contd.

PIED KINGFISHER. (*Ceryle rudis*). Found throughout India. Above 750 m in the Himalayas, *C. lugubris* replaces this.

WHITE-BREASTED KINGFISHER. (*Halcyon smyrnensis*). Plains and lower hills throughout India.

Kite

Any of various *hawks of the family *Accipitridae* with long, narrow, pointed wings, a deeply forked tail, a weak bill, and feet adapted for taking such prey as insects and reptiles. They are noted for graceful sustained flight.

BRAHMINY KITE. (*Haliastur indus*). This is a bright chestnut bird of prey with black wing tips and white head and breast found near water. It is a resident bird throughout India including the Himalayas up to 1,800 m, avoiding only deserts and thick forests. It is locally migratory. It derives its name from its traditional association with VISHNU, the God in the Hindu trinity. It resembles the ordinary Pariah kite in flight and habits, but differs from it in always frequenting the neighbourhood of water.

PARIAH KITE. (*Milvus migrans*). It is one of the most familiar birds of India. It is a large brown bird, soaring high in flight and scavenging about every bazar and house. The forked tail identifies it at once. It is found throughout India, including the Himalayas up to 2,400 m. Though mainly resident, it is locally migratory. It is a fearless scavenger.

Krait

A highly venomous nocturnal snake of the genus *Bungarus* native to Asia. It frequents cultivated lands and human dwellings, feeding on other snakes. NOTE. The krait found in India is *Bungarus coeruleus*.

L

Land management

Aims at using a given area of land wisely to the best advantage both economically and ethically. This includes conservation of water, protection of soil from erosion, restoration and increase of fertility and productivity.

Landing net

Net for lifting fish out of water, used when fish are hooked and played on tackle not strong enough to lift them.

Langur

Any of certain large, slender, long-limbed, long-tailed Asiatic monkeys of the sub-family *Colobinae*. The entellus *Semnopithecus entellus* (Syn. *Presbytis entellus*) is held

Langur—contd.

sacred by many Hindus and worshipped as Hanuman. Four species are found in India.

CAPPED LANGUR. (*Trachypithecus pileatus*). This is distinguished by a cap or crown of erect, long, coarse hairs directed backwards from the forehead. It is found in Assam. It is also seen in East Pakistan and Burma.

COMMON LANGUR. (*Presbytis entellus* Syn. *Semnopithecus entellus*). Found practically throughout India from the Himalayas to Cape Kanyakumari, except the western desert regions. Some 14 or less races are distinguished.

GOLDEN LANGUR. (*Presbytis geei*). Found on the banks of the Sankosh river, near Jammu close to the India-Bhutan border.

NILGIRI LANGUR. (*Presbytis johni* Syn. *Kasi johni*). Found in the Western Ghats at high elevations.

Lectotype

A specimen chosen as type of a species if the author of the classification fails to designate a type. See *Type locality*.

Left bank

See *Right bank*.

Leopard: Panther (*Panthera pardus*.)

A large, ferocious spotted, nocturnal carnivore, of the cat family, with a long tail. It is found in Africa and south Asia. It is a much smaller animal than the lion or tiger. The coat is greyish or whitish buff with characteristic black spots and rosettes. It lives in scrub jungle and rocky places with bushes and caves for shelter. Its greatest length is 2.25 m (7.5 ft). Three races are known: *Panthera pardus pernigra*; *Panthera pardus millardi*; *Panthera pardus fusca*. The last is the common Indian leopard, found in almost all forests. The race *pernigra* probably occurs in Kumaon and Garhwal. The race *millardi* is found in Kashmir at high altitudes. Leopards are hunted for their valuable skins. Types of leopards include:

BLACK LEOPARD. Variety found in south India. It is as beautiful as it is rare. It is also found in Java. Here is a case of *melanism.

CLOUDED LEOPARD. (*Neofelis nebulosa macrosceles*). This is found in the forests of Assam as also Nepal, Sikkim and Bhutan. It is nocturnal in habit and is rarely seen. The coat has a ground colour of brown or yellowish brown with dark blotches on the sides forming a clouded pattern. It is one of the thirteen rare animals of India, threatened with extinction.

HUNTING LEOPARD: CHEETAH. (*Acinonyx jubatus venaticus*). The general body colour is tawny to pale buff with a black stripe

Leopard: Panther. (*Panthera pardus*)—contd.

from the eye to the mouth and solid spots on the rest of the body. It loves open country and being an easy target, has been hunted almost to extinction. See *Cheetah*. It is a misnomer to call it a hunting leopard.

SNOW LEOPARD: OUNCE. (*Panthera uncia* Syn. *Uncia uncia*). This is found in the Himalayas from Kashmir to Sikkim at altitudes of 3,500 to 4,000 m, near the snow line. It is slightly smaller than the ordinary leopard, but with a relatively longer tail. The animal has a ground coat of grey tinged with buff with distinct spots on the head, neck and lower parts. It is valued for its fur and is trapped in pits. It is one of the thirteen rare animals of India, threatened with extinction.

Life cycle (Biol.)

The various stages or changes in form and functional activity through which an organism passes between successive recurrence of a specified primary stage, such as from fertilised ovum of one generation to the fertilised ovum of the next generation.

Life history (Biol.)

A history of the stages or changes through which an organism passes in its development from the egg, spore or other primary stage until its natural death. Cf. *Life cycle*.

Life zone

A biogeographic zone. A term mainly used in North America for zones in which animal and plant life vary according to altitudinal rather than to geographical factors. They are: Lower Sonoran (lowest desert type, at sea level in USA), Upper Sonoran, Transition, Canadian Hudsonian, Alpine and Arctic.

Limiting factor

The environmental factor that is of predominating importance in restricting the size of a population (e.g., lack of winter browse is a limiting factor for many deer herds). Applied to game management, the factor which outweighs all others in limiting *productivity.

Limnology

The scientific study of physical, chemical, meteorological and biological conditions in fresh-waters, especially of ponds and lakes.

Line

The thread used for angling. It may be of silk, nylon or terylene.

Line breeding (Genetics)

A form of mild inbreeding directed towards keeping the offspring closely related to a highly admired ancestor.

Lion

A large member of the cat family. It is a powerful tawny carnivore; with tufted tail and (in the male) a mane. The Indian lion is *Panthera leo persica* while the African lion is *Panthera leo leo*. Except for slight differences in appearance they are similar in habits. The Indian lion is now confined to the Gir Forest where a 1955 census revealed about 290 lions. Average length from nose to tip of tail, 2.80 m; largest specimen on record 3.23 m. Lions inhabit sandy plains and rocky places with thorny thickets, hunting usually by night. Lions have been the favourite sport of big game hunters. Now the lion is strictly protected, as it is an animal threatened with extinction, in the Gir sanctuary in Gujarat.

Loafing cover

A place offering shade in summer, or sun and wind protection in winter, for idling.

Lophophorus impejanus

See *Monal pheasant*.

Low (N)

The trough of a cycle. A period of scarcity.

Loxodonta africanus

See *Elephant*.

Lutra lutra: L. perspicillata

See under *Otter*.

Lutrogale perspicillata

See under *Otter*.

Lynx. (*Felis lynx isabellina* Syn. *Felis lynx*).

Any of a group of wild cats found throughout the northern hemisphere and characterised by a ruff on each side of the face, long legs, a short tail, long, tufted ears, and keen vision. In India it is found in Ladakh only and in adjoining Tibet. This is a race of lynx of Northern Europe and Asia with a distinctive sandy grey or isabelline colouring, hence the racial name *isabellina*.

M

Mahseer : Mahi. (*Barbus mosal*).

A large Indian fresh water food and sport fish, of family *Cyprinidae*.

Mallard. (*Anas platyrhynchos*).

A common and widely distributed wild duck which is the source of the domestic ducks. It breeds in great numbers in Kashmir. It is found in winter in Punjab and Uttar Pradesh. A few wander south to Madhya Pradesh and Maharashtra.

Mammalia: Mammals

The highest class of vertebrate animals, characterised by possession of hair, secretion of milk to feed the young, and possession of 3 ear ossicles connecting ear-drum with inner ear, a brain, and warm blood.

Mammal

An animal belonging to the highest class of vertebrata (Mammalia) comprising man and all other animals that nourish their young with milk, that have the skin usually covered with hair, that have mammary glands, a brain, a muscular diaphragm separating heart and lungs from the abdominal cavity, and that reproduce viviparously. NOTE. Most mammals live on land, but some are found in the sea (such as whales, sea lions, walruses, and dugongs).

Management

Applied to *natural resources, such as land, man-power, forest, wild life, the term connotes their wise and skilful use, after a careful survey, planning, organization and coordination of the several factors involved.

Management, game

The art of producing sustained annual crops of wild game for recreational purposes.

Marginal land

Land which lies on the margin of productivity; i.e., one, which, due to unfavourable topography, climate, etc., will yield a harvest of products, which, when marketed at existing price levels, will barely cover the cost of cultivation.

Markhor: Markhoor. (*Capra falconeri*).

This is a species of wild goat found in the valleys of Kashmir up to the snow line. It is an inhabitant of dense pine and birch forests whose grassy glades form their grazing ground. It usually lives in herds and under varying conditions. It is also found in Afghanistan.

Mast trees

Trees yielding nuts or acorns (such as oak, beech, chestnut, etc.) suitable for feeding animals. NOTE. These provide abundant food supplies for wild life. About 10 trees per hectare are desirable.

Melanin

Black, dark-brown or yellowish pigment, colouring many animals, e.g., man, other mammals, many birds. Sometimes formed in plants.

Melanism

Abnormal development of dark pigmentation in the skin, hair, feathers etc. Cf. *Albinism*.

Menagerie

A place where animals are kept and trained, especially for exhibition. In particular, a collection of wild or foreign animals in cages or enclosures, as in a circus.

Migration. (Biol.)

Of animals, birds and fishes, the movement from one *habitat or region to another, generally in large numbers, and especially done periodically. NOTE. Migration is influenced by climate, food and such other factors. See *Migratory*.

Migration, altitudinal.

Migration involving different elevations in mountain country.

Migration, anadromous

Of fish, which ascend rivers from the sea at certain seasons for breeding. In Salmon migration the young go to saltwater for development and back to fresh-water for breeding.

Migration, catadromous

Of fish, living in fresh-water and going to the sea for breeding. Eels migrate to saltwater for breeding and back to fresh-water for maturing.

Migration, diurnal

Migration during the day. NOTE. Most water-fowls are diurnal migrants.

Migration, nocturnal

Migration during night. NOTE. Small birds are mostly nocturnal migrants.

Migratory. (Biol.)

When applied to mammals, birds, fishes, etc. the term denotes *migration or habitual or occasional movement from one region or climate to another.

Mobility

The tendency of the individual animal to change location during the day or so between seasons or years. See *Cruising radius*.

Monal pheasant

See *Pheasant* (MONAL PHEASANT).

Mongoose

Archaic forms Mungoose. Pl. Mongooses. This is an agile, keen-sighted, slender, ferret-like, viverrine, flesh-eating mammal of India. It has a sharp stout and a long heavy tail. It captures and feeds on snakes, including the most venomous ones and on rodents. It can be domesticated. Species found in India are:

COMMON MONGOOSE. (*Herpestes edwardsi*). A tawny yellowish grey mongoose with a

Mongoose—contd.

grizzled "pepper and salt" tinge. Three races are known: (i) *nyula* of North and Central India; (ii) *ferrugineous*, a desert form, and (iii) the typical *edwardsi* found in South India.

CRAB-EATING MONGOOSE. (*Herpestes urva*). Found in Assam, eastwards to Burma, South China and Malaya. It is an expert swimmer, and catches crabs, fishes, frogs, etc., in hill streams.

SMALL INDIAN MONGOOSE. (*Herpestes javanicus*). Found in North India from Kashmir eastwards to Assam and Orissa. It is only about 50 cm (20 in.) in length and lives in holes burrowed by itself.

STRIPE-NECKED MONGOOSE. (*Herpestes vitticollis*). The black neck stripe reaching backwards from the ear is distinctive. It is found in the Western Ghats from North Kanara southwards and in the adjoining South Indian hills.

Moorhen

A common term for the water hen and related birds. Birds found in India are:

INDIAN MOORHEN. (*Gallinula chloropus*). On land a typical waterhen; and in water like a small duck. Found throughout India up to 1,800 m.

PURPLE MOORHEN. (*Porphyrio poliocephalus*). A handsome but clumsy purplish blue tail with long red legs. Found throughout the plains of India.

Moschus moschiferus

See *Deer* (MUSK DEER).

Municipal park

A park or garden owned and administered by a city or town municipality, generally for recreation of the public.

Multiple use

The planned utilization of an area for a variety of purposes simultaneously. In forestry multiple use implies management designed to achieve maximum sustained yields of timber and water, soil conservation, flood prevention, wild life *conservation, and recreation.

Muntiacus: Muntjak

See *Deer* (BARKING DEER): also *Muntjak*.

Muntjac: Muntjak: Barking Deer

Any of various small-horned deer of South-Eastern Asia and Indonesia, constituting the genus *Muntiacus*. The animal found in India and Java, *Muntiacus muntjak*, has well-developed horns on bony pedicels. Its haunts are thickly-wooded hills. The male is distinguished by sharp exposed canine teeth and small upright antlers. Two forms are

Muntjac: Muntjak: Barking Deer—contd.

known in India: *Muntiacus muntjak vaginalis* in North India, *Muntiacus muntjak aureus* in the south. See *Deer*.

Musk deer

See *Deer* (MUSK DEER).

Mynah: Myna: MINA

Any of a group of tropical birds of south-eastern Asia related to the starling and belonging to the genera *Acridotheres*, *Gracula* and *Sturnus*. Indian mynahs are:

BANK MYNAH (*Acridotheres ginginianus*). This is found in the greater part of northern India, extending south up to about the latitude of Bombay. It flocks in open country and human habitations. It is very similar to the common Mynah. It is a resident species, being a local migrant partially.

BRAHMINY MYNAH (*Temenuchus pagodarum*). This is grey above and reddish fawn below, with glossy black crown and long recumbent crest and black wing quills. It is found almost throughout India, excepting the most arid and the humid evergreen regions. It is mainly resident but also a partial local migrant. It utters a pleasing little song in the breeding season.

COMMON MYNAH (*Acridotheres tristis*). A dark brown single-crested bird with white tail tip and wing markings and bright yellow-bill and feet. Often destructive to crops like grains, fruits, etc. It can live contentedly in a cage and can talk well.

GREYHEADED MYNAH (*Sturnia malabarica*). This is a small trim bird, brownish silvery grey above and rusty brown below, with blackish wing quills. It is found almost throughout India. It is subject to considerable seasonal local migration. It inhabits open, thinly-forested country and the neighbourhood of teak plantations and forest cultivation.

JUNGLE MYNAH (*Aethiopsar fuscus*). A local and patchily distributed species, similar in appearance to the common Mynah.

HILL MYNAH (*Gracula religiosa*). It is remarkable for its capacity to mimick human speech. In India it lives contentedly as a cage bird, being kept as a pet in homes.

PIED MYNAH (*Sturnopaster capensis*; Syn. *S. contra*). It is common in North India and Assam.

N

Nemorhadus goral

See *Goral*.

National park

An area dedicated by state for all time, to conserve the scenery and natural and historical objects of national significance, to con-

National park—contd.

serve wild life therein, and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations, with such modifications as local conditions may demand. (Indian Board for Wild Life, 1952).

A national park is created by an act of the competent legislature. Any institution which is prefixed by "national", whether it is a park or museum, belongs to the whole nation and is owned, legislated for and administered by the national, or central or federal government of a country. A "national park" has come to have a special significance since the creation of the first national park in the world — Yellow Stone National Park in USA in 1872. NOTE. These protect some of the outstanding forest and mountain sceneries and the abundance of wild life of many species. These are administered by the Forest Departments of States. The Indian Board for Wild Life, founded in 1962, serves in a quasi-official advisory capacity. Four Wild Life Sanctuaries established in India are of special importance in the survival of rare endangered species. The Gir Forest is the only remaining habitat of the Asiatic Lion (*Panthera leo persica*). The Kaziranga Wild Life Sanctuary is the principal remaining habitat of the Great Indian Rhinoceros (*Rhinoceros unicornis*). The Keibul Lamjao Sanctuary is the only habitat of the brown-antlered deer (*Cervus eldi eldi*) feared to be near extinction. The Kashmir stag (*Cervus elaphus hanglu*) is protected in the Dachigam and Cehumnaiya Sanctuaries. See *Zoological park; Park land*.

Natural history

Formerly the term included zoology, botany, geology, mineralogy and other subjects dealing with the animal, vegetable and mineral world. Now applied to a study of these subjects, especially animal and plant life, in a popular, non-technical manner.

Natural resources

All things produced by nature used to sustain or support life. Usually subdivided into renewable and non-renewable resources.

Renewable. Resources like sunlight, air, forest, vegetation cover, water and animals which either renew themselves by reproduction or are continued in supply by natural processes which can be aided or interfered with by man.

Non-renewable. Those resources which are not creative or productive themselves. These include minerals, petroleum, gas, coal, etc.

Natural Science

The systematic knowledge of *nature and the physical world including zoology, botany, chemistry, physics, geology, etc. Distinguished

Natural science—contd.

from mental or moral science, abstract mathematics, etc.

Natural selection

In evolution the process by which the individuals (of a species) with characteristics that help them to become adapted to their specific *environment tend to survive (*Survival of the fittest*) and transmit their characteristics, while those less able to become adapted tend to die out, so that in the course of generations there is a progressive tendency in the species to a greater degree of adaptation.

Nature

The material world, especially as surrounding man and existing independently of his activities, comprising all its diverse phenomena and the sum total of all forces at work.

Nature reserves

Particular tracks of land or pieces of landscape placed under strict protection from human interference. Such a protection preserves all plant species in the local community. See *Preserve*.

Nayan

Great Tibetan Sheep (*Ovis amon hodgsoni*). This is the largest of all wild sheep, standing about 1.2 m at the shoulder. Its horns are about 1 m (40 in.) long. It is long in the leg, graceful and light, and suggests an antelope in build. It is found in North Ladakh and on the plateau of Tibet, but in quest of grazing it occasionally crosses into Spiti, Kumaon and north Sikkim.

Neofelis nebulosa

See *Leopard* (CLOUDED LEOPARD).

Niche

A habitable position. The place occupied by a species in relation to other species.

Nidicolous

Of birds, which hatch in a relatively helpless state and remain in nest for a good time after hatching, e.g., sparrow. Cf. *Nidifugous*.

Nidifugous

Of birds, which hatch in an advanced state of development and leave the nest almost immediately, e.g., fowl.

Nilgai: Nilghai (*Boselaphus tragocamelus*. Plural *Nilgais* or *Nilgai*; also *Nilghais* or *Nilghai*. Also called *Blue Bull*).

This is a large bluish-grey antelope of India. Both sexes have dark manes. The bulls have a distinctive tuft of stiff black hairs on the throat, and possess stout cone-like horns. The animal is found in India from the base

Nilgai—contd.

of the Himalayas southwards to Mysore. It is absent in Bengal, Assam and the Malabar coast. It avoids dense forests. The male is coloured bluish grey; the hornless female is tawny. The nilgai is held sacred by the Hindus on account of its fancied kinship to the cow.

Non-migratory

That which does not migrate, or is resident.

Normal kill

The kill sustained by the most productive unit of the range or population.

Nycticorax nycticorax

See *Heron* (NIGHT HERON).

O**Omnivore**

Animal that feeds on both plant and animal food. Cf. *Carnivore*; *Herbivore*.

Open-water birds

Fowls, preferring the sea, wide estuaries etc. to more confined waters.

Otter

Any of a group of aquatic, fur-bearing, carnivorous, musteline mammals of the genus *Lutra*, and allied genera, related to the weasel and the mink, with webbed feet adapted for swimming, and a pointed long tail, somewhat flattened horizontally, acting as a rudder. The pelt is valued. In India, the common otter *Lutra lutra* or *L. perspicillata* is found only in Kashmir, the Himalayas and in Assam. The smooth Indian otter, *Lutrogale perspicillata* is found in the plains throughout India. The clawless otter *Amblyonyx cinerea* is the smallest of the otters, measuring only about 50 cm for the head and body with a tail of 30 cm. This is found in the Himalayan foothills from Kulu eastwards to Assam. NOTE. In Great Britain, the otter *L. vulgaris* is much hunted with dogs. See *Hunting*.

Out breeding

Mating between individuals not closely related.

Out flow (Wild Life).

See *Efflux*.

Over fishing

Fishing to the detriment of a fishing ground or to the depletion of a kind of fish.

Over population

An excess of population.

Over shot

The term is used with reference to a shooting block which has been visited too frequently by hunters so that the game is depleted.

Ovis amon hodgsoni

See *Nayan*.

Ovis orientalis

See *Shapu*.

P

Panda, lesser: Red panda (*Ailurus fulgens*).

A carnivore of the Himalayas, somewhat larger than a cat. It has reddish-brown fur, darker beneath; the face is marked with white. It has a long bushy tail marked with pale rings. It is found in the Himalayas from Nepal and Sikkim eastwards to Upper Burma and Southern China, at medium elevations of 1,800 to 3,600 m. Also called *Cat bear* and *Bear cat*.

Pangolin: Scaly Ant-eater

Any of several Asiatic and African mammals of genus *Manis* and related genera of order *Pholidota*, that feed mainly on ants, as the armadillo, the echidna, etc. The body is covered with large, flattened, reddish-brown imbricated, horny scales. It has a long sticky tongue and a long snout. It is able to roll itself into a ball when attacked. In India, the Indian Pangolin or Scaly Ant-eater, *Manis crassicaudata*, inhabits the plains and lower slopes of hill, south of the Himalayas. One other species, the Chinese Pangolin, *Manis aurita*, occurs in Assam.

Panther

See *Leopard*.

Panthera leo leo

African lion. See *Lion*.

Panthera leo persica

Indian Lion. See *Lion*.

Panthera pardus

See *Leopard*.

Panthera tigris

See *Tiger*.

Panthera uncia

See *Leopard* (SNOW LEOPARD).

Parasitism (Biol.)

A close internal or external relation between two organisms, which is detrimental to one partner (the *host) and beneficial to the

Parasitism. (Biol.)—contd.

other (the *parasite). The latter derives nourishment and usually other benefits (as shelter and transportation) from the former, causing some damage, but not usually killing, directly and immediately. See *Parasite*. Cf. *Symbiosis: Predatism*.

Park

- (1) Usually a large enclosed piece of ground (in Britain, attached to a country house).
- (2) Enclosure in town or city ornamentally laid out for public recreation.
- (3) Large tract of land kept in natural state for public benefit.

Park land

A grassland region with isolated or grouped trees, usually in temperate regions. The term can also be applied to a land with groups of cultivated trees or shrubs, suitable for use as a park.

Parrot

Any of numerous tropical and subtropical birds of Order *Psittaciformes*, with brilliant plumage, hooked bill and zygodactyl feet. They are excellent mimics and can simulate laughter and crying.

Parakeet: Parrakeet

Any of numerous rather small, slender *parrots with a long graduated tail. Birds found in India are:

ALEXANDRINE OR LARGE INDIAN PARAKEET. (*Psittacula eupatria*). Found throughout India. A popular cage bird.

ROSERINGED PARAKEET. (*Psittacula krameri*). Found throughout the plains and locally up to 1,500 m. A popular cage bird. Learns to repeat a few words and to perform tricks.

BLOSSOM-HEADED PARAKEET. (*Psittacula cyanocephala*). Found throughout India and up to 1,800 m in the Himalayas.

Partridge

Any of a number of game birds resembling domestic fowls, as the grouse, pheasant, quails, etc.

True partridges are similar to the *quails. Partridges found in India are given below:

BLACK (*Francolinus francolinus*). A typical partridge found in thick ground cover. It extends in various races throughout India. A resident species, ascending the western Himalayas up to 1,500 m. It is an edible wild bird sold in Indian markets. It affords good sport.

CHUKOR OR CHIKOR (*Alectoris graeca*). It is distinguished by the black loop on the face and throat and by the beautiful bars on the flanks. Under the name of Greek Partridge, it has a wide distribution in Europe, Asia. In India the race *A. g. chukor* is well

Partridge—contd.

known to sportsmen as *Chukor*. It is a resident bird found at elevations between 3,000 and 4,500 m. It differs from the French partridge (*A. rufa*) in minor details. It is frequently found on barren hill-sides.

GREY (*Francolinus pondicerianus*; Syn. *Ortygornis pondicerianus*). A typical brown partridge. Two races are found in India. It is strictly a resident species. It is an edible wild bird sold in Indian markets. It is a popular cage bird, prized for its fighting qualities. It affords good sport.

HILL PARTRIDGE (*Arborophila rufogularis*; Syn. *A. torqueola*). This is found in the Punjab Hills, Himachal Pradesh, and eastwards up to Assam.

PAINTED PARTRIDGE (*Francolinus pictus*). This is brownish black, profusely spotted and barred with white. It is found in Peninsular India south of a line running from Kutch to the Chilka Lake (Orissa), through Gwalior. It is an edible wild bird sold in the markets. It affords good sport.

Pastime foods

Food eaten principally for the purpose of spending time agreeably, *i.e.*, for diversion or amusement, rather than for palability or nutrition.

Pavo cristatus

See *Peacock*.

Peacock: Peafowl

Any of a number of large related birds of genus *Pavo*. One species, common in India, is described below:

COMMON PEAFOWL (*Pavo cristatus*). It is a native of India and Ceylon. The male has a crest and striking plumage and tail marked with iridescent ocelli ("eyes"); it is able to expand its tail erect, like a fan, to produce a gorgeous display.

It is found almost throughout India, ascending the Himalayas up to 600 m and locally up to 1,500 m. It is a purely resident bird. It has been declared as the national bird of India. It keeps down snakes and other poisonous reptiles. When young they are good for eating.

Peck order: Pecking order

The basic pattern of social organisation within a flock of poultry (extended to animals) in which each bird is permitted to peck another lower in the scale without fear of retaliation and is expected to submit to pecking by one of higher rank. Cf. *Hook order*. The status of each individual animal in the social hierarchy. Equivalent to *Social rank*. So-called from the fact that birds enforce this social rank by pecking an inferior or being pecked by a superior.

Pelican

Any of various large, gregarious, totipalmate, water birds of the genus *Pelecanus*, with a long neck, short legs, webbed toes. They have a large membranous distensible pouch which hangs from the lower bill and serves for storing fish. They live principally on fish, but also on other aquatic animals. NOTE. There is a fable that a pelican feeds or revives its young with its own blood. Pelicans found in India are given below:

SPOTTED-BILLED PELICAN: GREY PELICAN (*Pelecanus philippensis*). This is a huge squat pelican with an enormous beak, familiar to everyone through the Zoo. It is found throughout the better watered tracts of India, wherever there are large expanses of water suitable for it to fish in. It is a resident bird, but capricious; also locally migratory. They fish by cooperative effort, swimming in a semi-circle and driving the fish before them into shallow waters, and scooping them upon their pouch, which acts like a landing net.

ROSY PELICAN (*Pelecanus onocrotalus*). Found near the Great Rann.

People's park

A public park, usually owned and administered by a municipality, in which recreation is the chief object.

Perch

A roost for a bird. NOTE. Some birds need perches higher than the surface of the forest canopy. Removal of wolf-trees may evict them completely.

Perissodactyla

Ungulate mammals which walk on hooved toes, with weight-bearing axis along the third toe which is larger than the others in most cases; *e.g.*, rhinoceros, horse.

Phalacrocorax carbo

Large cormorant. See *Cormorant*.

Phalacrocorax fuscicollis.

Intermediate cormorant. See *Cormorant*.

Phalacrocorax niger

Little cormorant. See *Cormorant*.

Pheasant

Any of various large, gallinaceous game birds, of the genus *Phasianus* and related genera of family *Phasianidae*, with a long, sweeping tail and brilliant feathers. They are most abundant in Asia and the adjacent islands. Those found in India include:

BLOOD PHEASANT (*Ithaginis cruentus*). Found in the mountains of India and China; remarkable for the bright red colour of the throat and breast.

Pheasant—contd.

CHEER PHEASANT. (*Catreus wallichii*). A buff or greyish pheasant found in the sub-Himalayan tracts. It shows a bare red eye patch and a long narrow tail.

KALIJ PHEASANT. (*Lophura lucomelana*). A crested Indian pheasant. Found at high elevations up to 3,000 m in the Himalayas (Kashmir, Himachal Pradesh, North-East Frontier Agency).

MONAL PHEASANT: IMPEYAN PHEASANT. (*Lophophorus impejanus*). A showy pheasant found at high altitudes in the Himalayas, especially Kashmir, Bhutan, Sikkim, and the North East Frontier Agency.

PUKRAS: PUKRAS PHEASANT: KOKLAS PHEASANT. (*Pucrasia macrolopha*). A pheasant found in North India and the Himalayas. The male is mostly crested with long black ear-tufts.

TRAGOPAN: HORNED PHEASANT. (*Tragopan* species). A brilliantly coloured Asiatic pheasant, with the head of the male ornamented with a pair of fleshy erectile horns. Found in North-East Frontier Agency.

Phoenicopterus roseus

See *Flamingo*.

Phytogeography

The *biogeography of plants. The scientific study of plant life with reference to the distribution of plants on earth and the mutual influence of environment and plants on each other.

Pigeon

Bird of the family *Columbidae* especially the rock-dove (*Columbia livia*) which haunts rocks and large buildings and is also domesticated. The carrier or homing pigeon is trained to fly home over long distances with message attached to its neck or leg. Birds found in India are:

COMMON GREEN PIGEON. (*Crocopus phoenicopterus*). Found throughout the Indian Union.

BLUE ROCK PIGEON. (*Columbia livia*). Found throughout India and locally up to 3,900 m in the Himalayas.

Pintail

Sometimes called sprigtail duck. A long-necked, slender and graceful duck (*Anas acuta*), with long neck and sharply pointed tail. It breeds in northern hemisphere. It is purely a winter visitor in India (October to March), being found throughout the country. It occurs in small flocks near the shore and feeds upon weeds, crustaceans and insects. It easily holds the first place among the ducks of India as a sporting bird, as a good bird for the table and for grace of shape and carriage.

Pit method

This is one of the most common methods for capturing elephants. A pit is dug in the usual path of wild elephants; it is partly filled with slash to break the fall of the elephant, and is covered over with bamboos and earth so that there are no suspicious signs of the pit. When an elephant happens to walk along the path, it falls into the pit. It is then removed with the help of tame elephants. Cf. *Kheddah*.

Plant conservation

This is concerned with the preservation of species or communities of plants that are of interest for their beauty, rarity or inherent scientific value. Cf. *Forest conservation*, which is concerned with the proper methods for utilization of forest trees for timber and other useful products. This may also include preservation of individual tree species of special interest. See *Preserve; Nature reserves*.

Plant succession : Floral succession.

See *Succession*.

Plantigrade (Adj.)

Walking on the whole sole of the foot, as man, the bears, etc. Also a noun meaning a plantigrade animal.

Platalea leucorodia

See *Spoonbill*.

Plover (Family Charadriidae)

Any of a number of related gregarious, shore birds especially of genera *Charadrius* (e.g., ringed plover) and *Squatarola* (grey plover), with a short tail long pointed wings and usually brown or grey feathers, mixed white. NOTE. The golden plover (*Pluvialis dominica*) is remarkable for its long migrations between arctic breeding grounds and its winter home in Patagonia. Plovers are highly esteemed for the table, and for this reason they are given little chance of increasing in numbers. The Little Ringed Plover (*Charadrius dubius*) is found all over India and up to 1,200 m in the Himalayas.

Poacher

One who kills or takes game or fish illegally. One who shoots or otherwise destroys or captures wild life, violating the local game laws, shooting rules and ethics of sportsmanship. Those who shoot from vehicles at night, over salt-licks, females and immature young, etc. are usually included in this category. Cf. *Sportsman*.

Pochard

An Old World diving duck (*Aythya ferina* Syn. *Nyroca ferina*), with a chestnut red head. In India it is a winter visitor (November to March). It is found throughout northern

Pochard—contd.

India, scarcer towards the south up to Mysore. It gets its food consisting of roots and buds of aquatic plants by diving deep under water. It is mainly seen in the larger *jheels* and tanks.

Point of resistance

The minimum population or density necessary for recovery of productivity.

Polygamous species

Species in which the males mate with more than one of the opposite sex. Such species are pheasants and deer, can be replenished satisfactorily by restricting the killing of females only.

Population cycle (Wild Life)

Periodic rise and fall of population of a species.

Population pressure (Biol.)

The sum total of all factors, such as increase in population, decrease in available food supply, etc. which tend to reduce the capacity of the *environment to support the population. If the pressure is not released, *migration or expansion of *range, or extinction or decline in population will result.

Porcupine

Any of a group of related gnawing *rodents, of the genus *Hystrix*, having coarse hair mixed with stout erectile spines or quills. Three species are known in India. They are, (i) *H. leucura*, found from the Himalayas to Kanyakumari in rocky hill-sides; (ii) *H. hodgsoni* found only in central and eastern Himalayas, Assam and lower Bengal; and (iii) *Atherurus macrurus*, the brush-tailed porcupine, found in lower Bengal and Assam.

Pot shot

Literally a shot at game with a view to bringing it to the cooking pot; now usually applied only to unskilled random shooting.

Predation pressure

The effect of predation on a natural community especially with reference to survival of species preyed upon.

Predatism (Biol.)

The practice of living as a *predator. Cf. *Parasitism*.

Predator (Wild Life)

An animal which preys on other inferior or weaker animals. NOTE. Predators have an important role in regulating *balance of nature. Predator-prey relationship is intricate. Different forms of predation can be recognised.

CHANCE PREDATION: When the prey species is temporarily at a disadvantage and is seized by a predator.

Predator (Wild Life)—contd.

HABIT PREDATION. When a species or individual habitually preys on another weaker species.

SUCKER-LIST PREDATION. When mentally and physically deformed individuals are eliminated by predators.

SANITARY PREDATION. When diseased, crippled or parasitised individuals are taken by predators.

Presbytis entellus

See *Langur* (COMMON).

Presbytis geei

See *Langur* (GOLDEN).

Presbytis johni

See *Langur* (NILGIRI).

Preservation (Wild Life)

Saving from or maintaining against injury or destruction. Keeping safe and undisturbed for private or public use.

Preserve

An area (as a tract of land or body of water) restricted for the protection or preservation of animals, trees or other natural resources, e.g., a wild life preserve. Also, area used for regulated *hunting or fishing. Cf. *Sanctuary*.

Pressure

Applied to wild life *management, a factor that tends to reduce a wild life *population, especially one which arises from human activity. See *Pressure, hunting; Population pressure*.

Pressure, hunting

The accumulated effect of hunting or shooting on any species of wild life or on wild life generally. It can be expressed in gun-hours.

Prey

An inferior or weaker animal which is preyed upon by a *predator. An animal that is or may be seized by another to be devoured.

Primeval

Literally means "of or relating to the earliest ages of the world or human history". Natural, essentially uninfluenced by human activity. The use of the term in connection with forest, vegetation cover, etc., is deprecated, as it does not allow for evolution and other factors.

Productivity

The rate at which mature breeding stock produces other mature stock or mature removable crop.

Protected area

An area constituted by order of a State Government in India, to give protection to wild

life in places other than parks and sanctuaries. Refers chiefly to areas near River Valley projects and other irrigation works in and around large towns and sacred places.

Protection

Guarding against danger or injury. Partial protection of certain species is achieved by enforcing *close seasons and restricted shooting. Total protection is achieved by constituting *sanctuaries or by legally prohibiting the killing or maiming of a particular species at any time and in any place. Generally used now, only when referring to species or places which are totally closed to being used in any way, and implies a locking up, so as to prevent use.

Protective coloration (or coloring).

The natural coloration of any of certain organisms by means of which it blends with its normal environment and is thus protected from destruction by its enemies.

Pseudois nayaur

See *Bharal*.

Python

Any of various large non-venomous Old World tropical snakes of genus *Python*, which kills by constriction. Common in Indian forests.

Q

Quail

Any of various *game birds, native of Asia, Europe, Africa and America, resembling domestic fowls. It is a migratory bird, somewhat like a diminutive *partridge in shape and general coloration. It is much esteemed for the table.

COMMON OR GREY QUAIL (*Coturnix coturnix*).

A miniature partridge with a sandy coloration. It has a wide distribution in many parts of the Old World. It is highly migratory. It is mostly a winter visitor, though a large number are resident.

JUNGLE BUSH QUAIL (*Perdicula asiatica*). Netted on a large scale and may be usually had in most bird markets.

MOUNTAIN QUAIL (*Ophrysia superciliosa*).

RAIN OR BLACK-BREASTED QUAIL (*Coturnix coromandelicus*). Distinguished from the common quail by the black breast. It is found practically throughout the whole of India, ascending the Himalayas up to 2,000 m. In many areas it appears with the rains and leaves after breeding; hence the name rain quail. In other areas it appears to be resident. Netted on a large scale for sale in markets.

YELLOW-LEGGED BUTTON QUAIL; INDIAN QUAIL (*Turnix tanki*; Syn. *T. dussumieri*)

Quail—contd.

Order *Hemipodii*. It is resident in the greater part of India, ascending the Himalayas up to 2,400 m. It avoids thick forests, preferring corn fields and grassy plains.

R

Range

(1) The region throughout which a kind of organism or ecological community naturally lives or occurs. NOTE. This refers to geographical and altitudinal limits within which the species is found. Owing to seasonal migrations, the term 'winter range' and 'summer range' are frequently used and in the case of vanishing species, the terms 'former range' and 'present range'.

(2) An open region, over which cattle sheep and other livestock may roam and feed, especially when unenclosed.

Range, home

The area occupied by a given individual (of wild life). NOTE. It denotes the area needed for food, for raising a family, etc. It indicates the potential population density for any species.

Ratufa indica

See under *Squirrel*.

Recreation

Refreshment of mind and body by means of some pastime, agreeable exercise or other resource affording relaxation and enjoyment.

Refuge

An area designated for the protection of game animals, birds and fish, within which hunting or fishing is either prohibited or strictly controlled. Cf. *Sanctuary*.

Refuge cover

Vegetation from which game can not be driven by hunters.

Re-introduce

A term used when a plant or animal once existed in an area, has become extinct there and is being re-introduced from elsewhere. In such cases only the identical species and not a kindred species should be brought back into an area.

Renewable resources

See *Natural resources* (RENEWABLE).

Reproduction potential

The maximum or unimpeded increase rate of a species in an ideal environment. Syn. *Breeding potential*. See also *Breeding potential*.

Reptile (Biol.)

A class of cold-blooded, lung-breathing vertebrates, belonging to the Order *Reptilia*. This includes snakes, lizards, crocodiles, turtles, and tortoises. NOTE. Indian reptiles include the cobra, *Naja naja* and *N. tripudians*; the Russell's viper, *Vipera russelli*; the Krait, *Bungarus coeruleus* and two crocodiles *Crocodylus porosus* and *C. palustris*.

Resident

Of birds, meaning not migratory. See *Migration*.

Resources

Same as natural resources. All things produced by nature to sustain or support life. They include all potentially useful materials, forces, capacities and conditions provided by nature. See *Natural resources*.

Resources, conservation of natural

The protection, improvement and use of natural resources according to principles which will assure their highest economic and social service.

Rhinoceros

Any of various, large, ungainly, heavy, plant-eating perissodactyl *mammals of tropical Africa and Asia, with one or two upright horns on the snout. They have very thick, frequently folded skin. Family *Rhinocerotidae*. Five species are still extant. All species of rhinoceros are confined to the Old World and they differ remarkably from one another in structure. In India, the Great One-horned Rhinoceros (*Rhinoceros unicornis*) is found in Assam and Bengal. Though it prefers swamp and grass, it is also found in wooded jungles in ravines and low hills. This is one of the thirteen rare animals threatened with extinction and so it is given special protection in Kaziranga Wild Life Sanctuary in Assam. NOTE. *R. sondaicus* is known as the Lesser (or Javan) one-horned Rhinoceros; *Didermocerus sumatrensis* is known as the Sumatran (or Asiatic) two-horned Rhinoceros.

Rhinoceros unicornis

Great Indian one-horned Rhinoceros. See *Rhinoceros*.

Rhinoceros sondaicus

Lesser or Javan one-horned Rhinoceros. See *Rhinoceros*.

Right bank: Left bank

The true right bank is on the right and the true left bank is on the left when the angler is looking downstream.

Rodent

An animal belonging to the *Rodentia*, the order of gnawing or nibbling mammals, that includes the mice, *squirrels, beavers, etc.

Rogue

Any individual of a species which diverges in certain characters from those shown by the majority of the population. Abnormal characteristics may be inherited, induced by environmental factors or associated with disease, e.g., Rogue elephant.

Ruminants

Any animal of the artiodactyl suborder or division, *Ruminantia*, which comprises the various "cloven-footed" and "cud-chewing" quadrupeds. This group includes cattle, *bison, buffalo, sheep, goats, chamois, *deer, antelopes, giraffes, camels, *chevrotains, etc.

Russell's viper (*Vipera russelli*).

A highly venomous snake with distinctive markings; found in south-eastern Asia, including India.

S**Salmon**

A marine and fresh-water food fish, *Salmo salar* (Family *Salmonidae*), with pink flesh, common in the North Atlantic Ocean.

Sambhar

See *Deer* (SAMBHAR).

Salt lick

A place where salty or sulphurous earth, mud or water is found on the surface and wild animals habitually resort to eat, lick or drink the stuff.

Sanctuary

A sacred and inviolable asylum, or a place of refuge and protection for wild life. In India, a sanctuary is 'an area constituted by the competent authority in which killing, hunting, shooting or capturing of any species of bird or mammal is prohibited except by or under the control of the highest authority in the department, responsible for the management of the sanctuary'. In India a sanctuary is usually created by an Order or Gazette Notification of the State Government, published in the local Gazette. NOTE. Sanctuaries provide the protection and space critically needed by the larger predators and grassland dwelling big game and the freedom from human interference needed by nesting birds during the breeding season. In some countries such as the U.S. the migratory birds get at least partial relief from hunting pressure. In India sanctuaries are owned by the

Sanctuary—contd.

State Forest Department concerned; this facilitates the management of wild life, food and cover resources to an extent which is rarely possible in privately owned lands. The social uses of wild life include nature study, recreational hunting and fishing, photography and simple enjoyment of the out-doors. Sanctuaries serve the purpose of nature lovers; game preserves and natural parks are for tourists; game-management areas serve the purpose of hunters. See *Sanctuary*, *Sanctum sanctorum*, *Game management*. Cf. *Preserve*; *Refuge*.

Sanctum sanctorum

Literally, the most holy place. In India the term is applied to an inner sanctuary, 'sanctuary within a sanctuary', or portion of a wild life 'sanctuary' or park in which no forest operation or management is allowed, and in which sometimes no entry by visitors is allowed, in order to prevent any kind of disturbance to wild life. Cf. *Refuge*.

Saturation point

The maximum number of a kind of organism that can be carried on a particular locality or area under optimum conditions. NOTE. There is a limit to which animal population may increase, usually indicated by the *carrying capacity, sometimes controlled by psychological factors inherent in the animals themselves. See *Carrying capacity*.

Savannah

*Grassland region, with scattered trees grading into either open plain or wood land, usually in sub-tropical or tropical regions.

Season, close

A period, established by statute or other regulations during which it is illegal to fish, thus giving the fish freedom from interference during spawning. A similar period when hunting of animals is prohibited.

Secondary sexual character

Any of the characters of animals which differ between male and female, e.g., beard, antler, some plumage. Distinct from primary sexual organs (testis and ovary) and from accessory sexual organs (vas deferens and oviduct).

Selenarctos thibetanus

See *Bear* (HIMALAYAN BLACK).

Serow

A goat antelope of genus *Capricornis*, of eastern Asia, related to the goral. The Indian species, *C. sumatrensis* is found at high elevations (1,800 to 3,000 m) in the Himalayas from Kashmir to Mishmi hills in Assam. It is usually seen in association with *goral,

Serow—contd.

*shapu, *nayan, *ibex, *markhor and the Himalayan *tahr.

Shapu: Urial (*Ovis orientalis*).

See *Urial*.

Sheldrake

Any of several large wild ducks, that feed on fish, shell-fish etc. and nest in furrows. The plumage is variegated and often brightly coloured. Genus *Tadorna*. It is frequently found on sandy coasts in Europe, North America and Asia.

RUDDY SHELDRAKE: BRAHMINY DUCK (*Tadorna ferruginea* Syn. *Casarca ferruginea*). It is a winter visitor in India (October to April) and is found throughout in suitable places. It is a wary bird; to bag it is a triumph for the sportsman.

Shooting block

A *block of forest where shooting is allowed under a licence subject to specified rules and restrictions.

Shooting box

Small concealed spot or artificial hide in the forest in which guns take cover. Also a small house or lodge for the accommodation of a sportsman or sportsmen during the shooting season.

Shootable

Of game that can be shot legitimately.

Sitting in a Machan

See *Hunting* (SITTING UP IN A MACHAN).

Small bore (of a rifle barrel).

Having an inside diameter of 0.22 inch. Cf. *Big bore*.

Small game

*Game birds and mammals not classified as *big game. See *Game*.

Snipe

Any of several long-legged, wading birds of genus *Gallinago*, related to the woodcock, living chiefly in marshy places and characterised by a long, straight, flexible bill used in digging for worms. NOTE. Its erratic flight makes it a severe test of marksmanship.

FANTAIL OR COMMON SNIPE (*Gallinago gallinago*, Syn. *Capella gallinago*). A small long-beaked bird with dark brown, streaked plumage. It is found throughout India north of the Godavari, as a winter visitor; it is known to breed in Kashmir and Santal Parghanas.

JACK SNIPE (*Lymnocyptes minimus* Syn. *Gallinago minima*). Similar to common

Snipe—contd.

snipe and pintail snipe, but it has twelve pointed feathers.

PAINTED SNIPE (*Rostratula benghalensis*). It has wonderfully painted plumage. It is a resident species throughout India, ascending the Himalayas up to 1,500 m; wherever suitable swamps are found. As a game bird it is neither worth shooting nor eating.

PINTAIL SNIPE (*Gallinago stenura* Syn. *Cappella stenura*). It is similar to the common snipe except that it has 26 tail feathers of which the outermost eight on either side are stiff narrow and wire-like. It is a winter visitor to eastern and southern India.

WOOD SNIPE (*Gallinago nemoricola*). It breeds in the Himalayas at elevations above 600 m. It spends winter in the lower Himalayas and in the hills of South India.

Social rank

The place occupied by an individual animal in the social hierarchy among the animals with which it lives. See *Peck order*.

Spawning

Process in fish of fertilizing and shedding eggs.

Species (Bot., Zool.)

A term used in *classification to denote a sub-division of a genus, forming a group of closely allied, mutually fertile individuals, showing constant differences from allied groups. In the *binomial nomenclature of plants and animals, the second name (*i.e.*, the name by which the species is distinguished from other species of the species of the genus) is termed the *specific* name. Species of trees are usually distinguished by the characteristics of their fruits, flowers, leaves, bark, wood, etc.

Spinning (Fishing)

Form of fishing in which natural or artificial bait is cast, and then wound back, so that its appearance and behaviour suggest a swimming fish and thus induce attack by predatory fish.

Spoon bill (Platalea leucorodia).

A tall white bird, related to the ibis, immediately identified by the black spoon-shaped bill. It has long neck and legs, the toes being bordered by a membrane and webbed at the base. It lives in water and feeds on small crustaceans, molluscs, frogs and fish. *P.l. major* is found throughout India, except the drier and the more hilly regions. It is a resident bird.

Sportsman

A person who engages in the sports of the field and especially in hunting, fishing and

Sportsman—contd.

horse-racing. Generally used with reference to a *bona fide* sportsman, *i.e.*, a person who observes the game laws, shooting or fishing rules, and who also observes the ethics of sportsmanship even when these are not specifically laid down in the laws and rules. The opposite of a *poacher.

Squirrel

Any of the arboreal, bushy-tailed rodents constituting the genus *Sciurus* and allied genera (Family *Sciuridae*) as the common Indian five-striped squirrel, *Funambulus palmarum*. The term is also applied to the various other members of the family *Sciuridae* as the chipmunks, flying squirrels woodchucks, etc. The Indian Giant Squirrel, *Ratufa indica* is found in the mixed deciduous and moist evergreen forests of the Peninsula.

Stabilization

The state of maximum adjustment between organisms and an environment that is characteristic of an ecological climax community. NOTE. The term is applied when animal population or animal habitat is brought to a desired optimum state either by natural or artificial means.

Stag, Kashmir

See *Hangul*.

Stalking

See *Hunting* (STALKING).

State

An organized political community forming part of federal, central or union government, *e.g.*, a state of the Indian Union. NOTE. A state park or a state forest would be an institution owned, legislated for and administered by the state in which it occurs, as opposed to a national park/forest which would be owned, legislated for and administered by the Central Government. In U.S.A. there are state parks, as distinct from national (or federal owned) parks, and in Canada there are provincial parks (under the provincial governments) as well as the national parks under the dominion government.

Status

A term often used to denote the (present) position of a species with regard to population, degree of protection given, etc.

Stenothermous

Of organisms, which cannot tolerate a wide variation of temperature in environment. Cf. *Eurythermous*.

Still-hunting

See *Hunting* (STILL-HUNTING).

Stork

Any of various large, mostly Old World, long-legged, wading birds of *Cinconia* and allied genera with a long neck and long, stout, sharp straight bill, forming the family *Cinconiidae*. Storks are related to the *herons and *ibises. Often they are as tall as 1.2 m.

ADJUTANT STORK: ADJUTANT BIRD (*Leptotilos dubius*). Probably so-called from its fancied resemblance to a military figure in a parade ground. A large stork, standing 1.2 m high, with an enormous, wedge-shaped, yellow bill and with the neck and head bare of feathers. It feeds on carrion and on small aquatic animals or snakes. It is found in northern India, extending eastwards to Assam.

OPEN-BILLED STORK (*Anastomus oscitans*). A small stork, similar to the *White Stork* (below), characterised by a grooved bill, with the upper and lower parts touching only at the base and at the tip. Found throughout India.

PAINTED STORK (*Ibis leucocephalus*). A typical large stork with long, heavy, yellow bill, slightly decurved near the tip. Found throughout India.

WHITE STORK (*Cinconia cinconia*). An egret-like bird, pure white except for black wings. Found practically throughout India, though rather rare south of the Deccan.

WHITE-NECKED STORK (*Dissoura episcopus*). This large stork is easily distinguished by its white neck and distinctive plumage. It has a wide distribution in South and East Asia. It is a resident species throughout India. It is found singly, in pairs, or in small parties in open well-watered country such as flooded or irrigated land, rice fields or small patches of marsh. It ascends the Himalayas up to 1,200 m.

Stress

This term covers a group of physiological changes induced by crowding. It is a common and subtle force limiting population. Game harvest through hunting prevents stress.

Sub-species

Sub-division of species into two or more groups based on possession of slightly differing characters. Sub-species can usually interbreed and often grade into one another.

Succession (Ecol.)

A series of plants or animals following each other in time or place in a regular order. NOTE. Plant succession is important in wild life studies as various stages of succession

Succession (Ecol.)—contd.

will support different types of wild life in different numbers.

Survey

A wild life survey is a fact-finding, scientific investigation by qualified persons into the wild life resources, availability and type of cover, water, food supply, factors adversely affecting wild life, and so on, which should precede planning for the wise management of a given area.

Sustenance foods: Classes of

During the critical winter season, game animals eat different types of food according to availability. These are:

PREFERRED FOOD. Delicacies available only in the early part of winter.

STAPLE FOOD. Foundation of winter sustenance.

EMERGENCY FOOD. Capable of sustaining life but insufficient to maintain weight, vitality and resistance.

STUFFING FOOD. No nutritive value. Serves only to fill the digestive organs.

PASTIME FOOD. Food taken for enjoyment rather than for nutrition.

Synecology

Study of relationships of communities of organisms to their environment as opposed to those of individual species. Cf. *Autecology*. See *Ecology*.

Syntype

A member of a taxonomic type series when no holotype is designated. Cf. *Lectotype*.

T

Tahr

This is a beardless, wild goat of genus *Hemitragus*, found in two different widely separated regions of India. The two species are:

HIMALAYAN TAHR (*Hemitragus jemlahicus*). This is a wild goat with thick recurving horns, heavy body, robust limbs and with tangled masses of coarse and flowing hair on the body. The colour is deep reddish-brown. It is found throughout the Himalayas, in precipitous terrain of towering cliffs, rocks and dense scrub or forest, below the tree line, i.e., below 3,000 to 3,600 m.

NILGIRI TAHR (*Hemitragus hylocrius*). This is a close relative of the Himalayan species, and is slightly larger. It is found in the Nilgiri hills, the Anamalai hills and southwards along the Western Ghats at elevations of 1,200 to 1,800 m. Often miscalled the Nilgiri ibex.

Taxonomy

A classification of plants and animals according to their natural relationships. Orderly classification of plants and animals according to their presumed natural relationships, forming a basic biological discipline, involving the firm establishment of binomial nomenclature and the static concept of fixity of species.

Teal (*Querquedula*).

Any of a large group of small, short-necked, fresh-water *ducks of *Anas* and other allied genera widely distributed in Europe, Asia, America. Esp. *A. crecca*. The several species are beautifully marked.

COMMON OR GREEN-WINGED TEAL (*Anas crecca*). It is distinguished from other Indian species by the conspicuous emerald green and black speculum and the pale cinnamon bar on the coverts. It is well distributed in India during winter. It is a favourite bird for the sportsman. Most commonly and abundantly netted for food.

COTTON TEAL (*Nettapus coromandelianus*). It is the smallest of the Indian ducks. It is a resident species in the plains, being locally migratory. It spends all the time in water and dives well, seldom venturing into land.

GARGANEY OR BLUE-WINGED TEAL (*Anas querquedula*). It is a winter visitor found throughout India. It is commonly and abundantly netted for food.

WHISTLING TEAL (*Dendrocygna javanica*). This is a heavy dark-brown duck with round wings, found in over-grown swamps. Its whistling call is distinctive. It is a resident bird found all over India. It prefers tanks, backwaters and swamps with abundant growth of weed and vegetation. It is not suitable for the table.

Territory

The ground belonging to a single individual animal, or to a pair, or to a social unit (or group represented by the chief individual). Usually defended against intruders, and often made distinctive by various means. Widely observed in mammals, birds, fishes, particularly during the breeding season. Several territories may be contained within a biotype.

Tetracerus quadricornis

Four-horned antelope. See *Antelope*.

Threskiornis melanocephala

White ibis. See *Ibis*.

Tiger (*Panthera tigris* Syn. *Felis tigris*)

A large, fierce, maneless, carnivorous mammal of the cat family, having a tawny yellow coat with black transverse stripes and white

Tiger—contd.

belly, and a long untufted tail that is ringed with black. It is typically larger than the lion with a total length usually of 2.7 to 3.0 m, but sometimes of more than 3.6 m. It lives usually on the ground, feeding chiefly on the larger mammals such as deer, antelope, etc.; when these are not abundant, it will attack domestic cattle. Some become man-eaters. NOTE. It has an extensive habitat ranging from Persia across Asia to Malay Peninsula, Sumatra and Java, and northwards to Siberia and Manchuria. In its habitat, eight races are known. The Indian race, designated as the typical tiger, is found practically throughout India from the Himalayas to Kanyakumari, except in the arid zone of the Punjab, Rajasthan and Cutch. A favourite method of shooting the tiger is from elevated platforms (*machans*).

Tracking

See *Hunting* (TRACKING).

Tropical

The region between the tropics of Cancer and Capricorn, i.e., 23½° north and south of the Equator.

Trout

Any fish of genus *Salmo*, other than the Atlantic salmon (*Salmo salar*), including the trout of Europe (*S. trutta*). Also any of various fishes of the salmon family noted for their gameness and prized as food.

Type locality

The locality in which a species is considered to be typically found (used when publishing a full description of a species). TYPE SPECIES is one designated as typical and definitive. TYPE SPECIMENS are known as HOLOTYPE if the author designates a single specimen as the type of a species. If a new species is named from several specimens and the author does not distinguish between them, these specimens are known as SYNTYPES, and it is open to another taxonomist to designate any one of them as the type for the species whereupon it becomes the LECTO-TYPE. In certain cases when the holotype or the lectotype is believed to have been lost or destroyed, another specimen may be selected as the type specimen of the species concerned, and this is known as the NEOTYPE. See *Holotype*; *Lectotype*; *Syntype*.

Type species (*Biol.*)

The species of a genus which is regarded as the best example of the generic characters, i.e., the species from which a genus is named.

Type genus (Biol.)

The genus which is formally taken and held to be most typical of the family or other higher group to which it belongs and gives it its name. Abbreviation, t.g.

Type specimen (Biol.)

An individual animal or plant, used as the basis for the scientific description of a species etc. See *type locality*.

U

Ungulate

General term, now largely obsolete, for hoofed mammals, particularly **Artiodactyla* and **Perissodactyla*.

Urial: Shapu (*Ovis orientalis*)

This is a wild sheep, living in steep grassy hill slopes above the forest line, i.e., above 3,000 to 3,600 m in Ladakh, the Punjab and northwards in Tibet. The body colour is usually grey. It is distinguished from other sheep by its smaller size. It stands 0.9 m (3 ft) at the shoulder, with horns of about 0.6 m round the curves. In the Ladakh urial the horns turn inwards at the tips. In the Punjab race the horns tend to form a circle. This is probably one of the ancestors of domesticated breeds of sheep.

V

Variety

Sub-division of species or sub-species from which it can be distinguished by one or more characters, but with which it can still interbreed. Many plants have varieties well-known in horticulture.

Vermin

Noxious, mischievous or disgusting animals of small size and common occurrence, and difficult to control; these include various insects (e.g., flies, lice, bed-bugs), various mammals (e.g., rats) and sometimes birds (e.g., hawks and owls). In wild life management the term is restricted to mammals and birds which are injurious to crops, wild life, etc. Generally applied to such mammals as rats, mice and such pests, but sometimes animals which become too numerous and cause destruction are declared as 'vermin', such as wild dogs and crows.

Vulpes bengalensis

See *Fox*.

Vulture (Genus *Gyps*; Family *Vulturidae*)

Any of a number of large raptorial *birds of prey, related to the *falcons, *eagles and

Vulture—contd.

*hawks, with naked and usually brightly-coloured heads and dark plumage. They live on carrion, but are known to attack living animals. They are found in tropical and temperate regions. They have a hooked beak, with claws less strongly developed than those of the eagles or hawks.

BLACK, PONDICHERRY OR KING VULTURE (*Sarcogyps calvus*). A huge, black turkey-like vulture, found throughout India.

GRIFFON VULTURE (*Gyps himalayensis*). A resident mountain species, found throughout the Himalayas.

WHITE-BACKED OR BENGAL VULTURE (*Pseudogyps bengalensis*). A resident species, found throughout India and ascending up to 1,500 m in the Himalayas. This is the commonest vulture.

W

Warden

An official, usually of the Forest Department, charged with supervisory duties relating to wild life conservation and management. In India the designation "Wild Life Warden" refers to an officer of the rank of Assistant Conservator of Forests, and the designation "Chief Wild Life Warden" refers to an officer of the rank of a Divisional Forest Officer.

Water balance

The ratio representing the difference between water assimilated into the body and that lost from that body (as urine, faeces and sweat). Under average conditions, this is approximately equal to one.

Water hole

A natural hole or hollow containing water, as one in the dry bed of an intermittent river, or a spring in a desert, or a small pool or pond. NOTE. Wild game must come to water holes during the dry weather.

Water parting

A summit or boundary line separating the drainage of two distinct streams or coasts. Cf. *Watershed*.

Watershed

A region or area bounded peripherally by a water-parting and draining ultimately to a particular water course or body of water: the catchment area or drainage basin from which the waters of a stream or stream system are drawn. See *Water parting*.

Weasel

Any of a world-wide group of cunning, agile, carnivorous mammals of genus *Mustela*, related to the minks, stoats, martens, etc.,

Weasel—contd.

with a long, slender body, short legs and a long bushy tail. They feed on rats, mice, birds, eggs, etc. The Himalayan weasel (*Mustela sibirica*) is distributed in the temperate and alpine regions of the Himalayas, in open grass and scrub, above the tree line at elevations ranging from 1,500 to 5,000 m.

Wigeon: Widgeon

- (1) Any of various kinds of wild fresh-water *ducks found in many places, especially *Anas penelope* of Europe and *A. americana* of North America.
- (2) Any of various species of wild fresh-water *ducks of the genus *Mareca*, that are between the *teal and the *mallard in size. *M. penelope* (Syn. *Anas penelope*) is found in many parts of the Old World.

Wild life

Living things that are neither human nor domesticated. Applied especially to mammals, birds and fishes which are hunted.

Wild life areas

Areas devoted wholly or partly to wild life purposes can be classified as below:

SANCTUARY: Absolute protection of all animals is given.

REFUGE: Protection of certain species (or all species) during a part of the year.

PRESERVE: Here wild life is managed on a harvest basis.

Wild life conservation

This includes an ever-widening group of animals — mammals, birds, fish, reptiles, amphibians, arthropods (e.g., lobster) and molluscs (e.g. oyster). Certain aesthetically and economically important animals tend to dominate the list. Cf. *Wild Life Management*.

Wild life management

A branch of conservation which handles wild life as a renewable natural resource. Concerned primarily with production, it also undertakes control measures that will preserve a species or hold its population in bounds. NOTE. Wild life forms an integral part of the land and hence wild life management involves a type of land use.

Wilderness

In North America, a term denoting unspoilt area where wildness, vastness, remoteness and grandeur have a special appeal to naturalists and others wishing to escape the crowds and mechanization of present-day life.

Wolf

Any of a large group of flesh-eating, dog-like mammals of the genus *Canis*, widely distributed throughout the Northern Hemisphere with harsh grey or brownish-grey fur, erect pointed ears, and bushy tail, noted for fierceness, craftiness and rapacity. It is very destructive to game, sheep and cattle and will sometimes attack man, when several animals have gathered in a pack. The Indian wolf has a dingy reddish-white fur, some of the hairs being tipped with black. It is regarded as *Canis lupus pallipes*, or sometimes as a distinct species *Canis pallipes*.

Y**Yak (*Bos grunniens* Syn. *Poephagus grunniens*)**

This is a large wild or domesticated ox of Tibet and adjacent elevated parts of Asia. It has short, smooth hair on the back and long wavy hair on the breast, sides, legs and tail. It is up to 1.8 m high at the shoulder, and 550 kilograms in weight. It is smaller under domestication and lives as a beast of burden and source of flesh, milk, hide and hair. It is found in Northern Ladakh and sometimes in passes in east Kumaon.

Z**Zone**

Any of the five great latitudinal divisions of the earth's surface, named according to the prevailing climate, specifically the *torrid* zone, bounded by the Tropic of Cancer and the Tropic of Capricorn, two *temperate* zones bounded by the Tropics and the polar circles and two *frigid* zones lying between the polar circles and the poles. See also *Climatic zones; Life zones*.

Zone, roadside

A strip of varying width along a highway of road on which the scenic values are safeguarded from impairment by excluding or restricting the utilization of natural resources, commercial development, and occupancy.

Zone, waterfront

A strip of varying width along a lake, pond, streams, ocean, or other water body, on which the scenic values are safeguarded from impairment by excluding or restricting the utilization of natural resources, commercial development, and occupancy.

Zoo

Abbreviation for a zoological garden which is an area set aside for the exhibition of wild animals, which are maintained in cages and artificial enclosures, in such a manner as

Zoo—contd.

to restrict their freedom almost completely.
Cf. *Zoological park*.

Zoo-geography

A branch of *biogeography concerned with the geographical distribution of animals and especially with the determination of land and marine areas characterised by special groups of animals, and the study of the causes and significance of such groups.

Zoological garden

A place which aims at showing as large a number of mammals, birds, reptiles, fish etc., as possible, usually with a confined area in or near a city or town, for the recreation and education of the public, and to provide material for scientific study. The animals are usually kept in cages or res-

Zoological garden—contd.

tricted to small enclosures. Cf. *Zoological park*.

Zoological park

This is a *zoo without bars. The animals are comparatively free and are exhibited in their natural surroundings as far as possible, with the barriers and restrictions hidden or camouflaged from view. NOTE. Zoological parks can be constituted only where sufficient land is available and are best sited on the outskirts of cities. Cf. *Zoological garden*.

Zoology

The science that deals with the classification of *animals and the study of animal life. It is a division of *biology distinguished from *botany.

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NOTE.—The Author's forthcoming book, "Indian Forest and Forest Products Terminology—Part II; Forest Products Research, Extraction, Utilization and Trade" has been freely drawn up for some of the definitions of terms appearing there.

APPENDIX 1-A

List of Game Sanctuaries and other areas set apart for Wild Life Preservation

Name of the State (in alphabetical order)	Name of the Sanctuary (Year of formation)	Area		Location	Remarks
		Sq miles	Sq kms		
1	2	3	4	5	6
I. Andhra Pradesh	1. The Pocharam Sanctuary (1952).	50	130	Located in Medak Division and situated on the P.W.D. road from Medak to Yellaeddy, 20 km from Medak.	
	2. The Pakhal Sanctuary (1952).	339	880	Located in the Warrangal Forest Division.	
	3. The Eturnagaram Sanctuary (1953).	314	810	Located in the Warrangal Forest Division.	
	4. The Qawal Sanctuary (1-6-1964).	500	1,300	Located in Mancherial Forest Division, Adilabad District.	Proposed.
	5. The Kolleru Birds Sanctuary for breeding Pelicans (1-12-1963).	1,260	3,260	Located in West Godavari District, Eluru Forest Division.	
	6. Shri Venkateswara Sanctuary.	184	480	Situated in the Chittoor and Cuddapah districts.	Proposed.
	7. The Ikshwaku (Nagarjunasagar) Sanctuary.	227.5	590	Situated in Nalganda and Guntur districts.	Do.
II. Assam	1. The Kaziranga Sanctuary (1908).	165	430	In Sibsagar Distt. 220 km from Gauhati and 90 km from Jorhat on Assam Trunk Road.	Tall elephant grass ; bounded in the north by the Brahmaputra river. Principal refuge of great Indian Rhinoceros, buffalo, gaur, elephant, tiger, sambhar, hog deer, swamp deer, boar, crocodile and bird life.
	2. The North Kamrup (or Manas) Sanctuary (1905).	105	270	Kamrup district, 42 km from Barpeta Road Rly. Station and 180 km from Gauhati.	
	3. The Sonoi-Rupa Sanctuary (1934).	85	220	Located in Darrang Distt. 8 km from Dhekiajuli Rly. Station and 48 km from Tezpur.	This sanctuary is known for rhinoceros, elephant and bison.
	4. The Pabha (or Milroy) Sanctuary (1941).	20	50	Situated in North Lakhimpur 18 km from the town.	This sanctuary has been created mainly for the protection of the wild buffalo.

APPENDIX 1-A—contd.

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1	2	3	4	5	6
II. Assam—Contd.	5. The Garampani Sanctuary (1952).	5	13	Situated in Sibsagar Distt. at the hot springs near Garampani, 16 km from Golaghat on the road to Dimapur.	For wild birds.
	6. The Loakhowa Game Reserve.	27	70	Situated in Nowgong District on the Brahmaputra about 32 km from Nowgong and connected by a fair weather road.	
	7. The Orang Game Reserve.	24	60	Located in Darrang Distt. on the north bank of the Brahmaputra and almost opposite the Loakhowa Reserve.	
	8. The Tirap.	800	2,100	Mountainous region in northeast Assam on China border.	Tiger, takin and other wild life.
III Bihar	1. The Sasangdaburu Sanctuary (1936).	7.5	20	Located in the Saranda Forest Division of the Singhbhum District about 28 km from Barajamda Rly. Station.	
	2. The Baniaburu Sanctuary (1934).	50	130	Located in the Kolhan Forest Division of the Singhbhum District, nearest Rly. Station Sonna.	
	3. The Baresand Sanctuary (1946).	22.9	60	Situated in the Latchar Forest Division in Palamau Distt., nearest Rly. Station, Chipadohar.	
	4. The Kodarma Sanctuary.	68	180	Located in Kodarma Division of Hazari Bagh Distt. about 11 km from Kodarma Rly. Station.	
	5. The Tebo Sanctuary (1932).	56	145	Situated in Singhbhum Distt., Porahat Div., nearest Rly. Station Chakradharpur.	This Sanctuary is known for bison, spotted deer, sambhar, barking deer, etc.
	6. Jhilua Sanctuary.	N.A.		In Deoghar Division, Santhal Parganas, nearest Rly. Station Sultanganj.	
	7. Kaimur Sanctuary.	N.A.		On Kaimur Plateau, Shahabad Division.	

IV. Gujarat	1. The Gir Sanctuary (1900).	527	1300	It is situated within a distance of 32 km from Junagadh city.	On Kathiawar peninsula, arid desert with dry mixed deciduous teak forest surrounded by a belt of thorn scrub, intersected by narrow rivers; only remaining habitat of Asiatic lion (threatened with extinction); also chital, sambhar, boar, chinkara, four horned antelope, nilgai, monkey and leopard.
V. Jammu & Kashmir	1. The Dachigam Sanctuary (Upper and Lower).	55	140	Situated near Harwan, 18 km from Srinagar.	Densely forested Himalayan mountain area north and east of the valley of Kashmir between 3,000 and 4,000 m; primary refuge of the rare Kashmir stag; also musk deer, leopard, black bear, brown bear, boar, pheasants and other wild life.
	2. The Desu Sanctuary .	22.75	60	Located in Desu Block in the Kashmir South District, 40 km from Anantnag.	
	3. The Chumania Basin Sanctuary.	16	40	Situated in the Arau Valley above Pahalgam in the Kashmir South Distt.	
	4. The Shankaracharya Hill Sanctuary.	0.7	2	Situated in Srinagar.	Known for Chikor.
	5. Ajas Sanctuary.	13	35		
	6. Upper Chashma Shahi Rakh.	2.75	7		
	7. Achabal Part A.	4.32	11		
	8. Sum Chan & Saplivemines Nullah.	..	..	In Kishtwar.	
	9. Tunnel Rakh.	12.1	30		
	10. Tandoh Rakh.	0.15	0.4		
	11. Pattankar & Kala Nand.	..	..
	12. Kulkain Tata Kutl.	..	..	In Poonch.	
	13. Sansu.	Game Rakh in Jammu.	
	14. Tandeli.	"	
	15. Kotli.	"	
	16. Thanao.	"	

APPENDIX 1-A—contd.

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1	2	3	4	5	6
V. Jammu & Kashmir—Contd.	17. Jaganon.	Game Rakh in Jammu.	
	18. Dalsar.	"	
	19. Gunar.	"	
VI. Kerala	1. The Periyar Sanctuary (1940).	310	800	Kottayam Distt. Situated 110 km from Kottayam and 145 km from Madura in Madras.	The Peermade game area of 1,165 sq. miles forms a bufferbelt to the Sanctuary.
	2. The Nayyar Sanctuary.	50	130	Trivandrum District.	Recently established.
	3. The Vazhani-cum-Peechi Sanctuary.	49	127	Trichur District.	Do.
VII. Madhya Pradesh	1. Kheoni Sanctuary, Dewas Division.	20.00	50	34 km from Kannod.	Known for tiger, panther, deer, sambhar and spotted deer.
	2. Shikarganj 'B' Reserve Gaunar Sanctuary Block No. 11, West Sidhi Division.	12.12	31.4	Medwas Range, Sidhi District.	
	3. Dubri Sanctuary, West Sidhi Division.	96.99	251	Medwas Range, 100 km from Sidhi. (Sidhi District).	
	4. Shikarganj Reserve Block No. 1, West Sidhi Division.	4.07	10.5	Medwas Range, 65 km from Sidhi.	
	5. Majhouli Shikarganj Sanctuary Block No. II, West Sidhi Division.	1.75	4.5	28 km from Majhouli and 65 km from Rewa District.	
	6. Panna Game Sanctuary, North Panna Division.	122.20	1094	16 km from Panna in Panna District.	
	7. Siri Game Sanctuary, South Panna Division.	6.16	19.6	38 km from Panna in Panna District.	
	8. Block 4 of Shikarganj 'C' Naurhiya Block No. II, North Shahdol Division.	5.00	13	Beehari Range, 24 km from Beehari.	
	9. Block 5 of Shikarganj '6' Naurhiya Block No. III, North Shahdol Division.	2.00	5	Do.	
VIII. Madras	1. The Mudumalai Wild Life Sanctuary (1940).	124	320	In the Nilgiris Forest Division, situated 65 km from Ootacamund on the Ootacamund-Mysore Road and 100 km from Mysore.	

	2. Vedanthangal Sanctuary (1956) (Lake).	0.12	0.3	87 km from South Madras city.	Bird sanctuary par excellence in South India. Countless water birds breed in winter (Oct. to March). Snow-white egrets, cormorants, openbill storks, grey herons, white ibises, night herons, pond herons, etc. are found.
	3. Guindy Park Reserve (Deer Sanctuary).	0.9	2.4	Adjacent to Raj Bhawan, Madras.	For black buck and cheetal.
	4. Kodiak Kadu.	6.7	17.3	Point Calimere, Tanjore District.	For black buck, spotted deer, wild pigs and flamingos.
	5. Tiger Sanctuary.	200	518	Entire Papanasam Reserved Forest and Singampatti Ex-Zami. Forest in Tirunelveli District.	For tiger, panther, Nilgiri langur, sambhar, spotted deer, mouse deer and wild pig.
IX. Maharashtra	1. The Radhanagari Sanctuary (1960).	8	20	In Kolhapur District, Radhanagari Range.	Mainly for Bison.
X. Mysore	1. The Janger Valley Sanctuary.	86	220	Located in Chikmagalur District.	
	2. Dandeli Sanctuary (1949).	80	210	The sanctuary comprises the two forest ranges of Virnoli and Kulgi in North Kanara District.	
	3. The Nagarhole Sanctuary (1955).	110	285	Situated in Coorg District.	Bison and elephants most common.
	4. The Bandipur Sanctuary.	22	60	It is a "Sanctorum" within the Venugopal Wild Life Park. It adjoins the Mudumalai Sanctuary of Madras State.	
	5. Ranganthitoo Bird Sanctuary.	1.66	4.3	Located at a distance of 14 km from Mysore city. Consist of Islands in the Cauvery river.	Open bill storks, white ibises, night herons, Indian darters, cormorants, cattle egrets can be seen throughout the year. Breeding season June to August.
XI. Orissa	1. The Raigoda Wild Life Sanctuary (1938-39).	17	44	Situated in Dhenkanal District. It is approached by road from Angul and is 35 km south of Angul Town. The nearest rail-head is Meramandali which is 195 km from Sambalpur.	Known for elephant, bison, sambhar, spotted deer, bear, nilgai, barking deer, tiger, panther, jungle fowl and peafowl.

APPENDIX I-A—contd.

1	2	3	4	5	6
XI. Orissa—Contd.	2. Debrigarh Game Sanctuary (1931).	5½	15	In Bhatli Range of Sambalpur Div. in the Sambalpur District.	
	3. The Chandka Sanctuary (1935).	12	30	Located in Puri District. It is 13 km from the famous Khandagiri caves and 19 km west of Bhubneswar. Approachable from Bhubneswar Rly. Station and from Cuttack.	
	4. The Balukhand Sanctuary (1935).	5.09	13.20	Located in Puri Distt. It is just on the sea-shore and is only 6 km from Puri, covering the Balukhand Casuarina plantation.	For black buck.
XII. Punjab	1. The Hissar Cattle Farm Bir (1942).	10.58	27.40	District Hissar.	
	2. Bir Ghugiana (1958).	7.30	18.90	District Bhatinda.	
	3. Bhagirat Bhagti Ashram (1958).	0.05	..	District Gurgaon.	
	4. Dalhousie Municipal Forests (1958).	..	..	District Gurdaspur.	
	5. Glen Forests in Simla, Hazel-mera and Cheriten Estates (1958).	0.51	1.30	District Simla.	
	6. Tara Devi (1952).	0.64	1.65	Do.	
	7. Karol (1952).	1.42	3.70	Do.	
	8. Chail and Pashgaon (1952).	9.11	23.70	Do.	
	9. Manali (1954).	9.60	25.00	District Kangra.	
	10. Kais (1954).	5.28	13.67	Do.	
	11. Khokhan (1954).	5.16	13.40	Do.	

	12. Kanawar (1954).	21.00	54.40	District Kangra.
	13. Chandigarh Lake (1960).	..	..	District Ambala.
	14. Bir Shikargah (1952).	2.96	7.70	Do.
	15. Kalesar Forest Area.	18.01	46.70	Do.
	16. Darpur (1956).	14.47	37.50	Do.
	17. Bhadson and Aishban (1952).	4.12	10.70	District Sangrur.
	18. Bir Moti Bagh (1952).	2.02	5.20	District Patiala.
	19. Bir Bhunesheri (1952).	3.21	8.30	Do.
	20. Bir Mehswala (1952).	0.82	2.10	Do.
	21. Bir Bhupinder Sagar (1952).	5.00	13.00	Do.
	22. Bir Dasanjow (1952).	2.31	6.00	Do.
	23. Bir Theh Majibullah (1957).	1.19	3.10	District Karnal.
	24. Bir Barason (1957).	1.74	4.50	Do.
	25. Bir Kohli Khera (1958).	2.33	6.05	Do.
XIII. Rajasthan	1. The Jaisamand Game Sanctuary (1955).	40	100	Situated 48 km from Udaipur.
	2. The Sawai Madhopur Game Sanctuary (1955).	50	130	It is situated 22 km away from Sawai Madhopur.
	3. The Sariska Game Sanctuary (1955).	36	90	It is located 35 km from Alwar.
	4. The Darrah Game Sanctuary (1955).	40	100	The sanctuary is located 50 km from Kota on the Kota-Jhalawar Road in Rajasthan.

APPENDIX 1-A—*contd.*

1	2	3	4	5	6
XIII. Rajasthan— <i>Contd.</i>	5. The Ram Sagar Game Sanctuary (1955).	7	18	Located 35 km from Dholpur in Bharatpur District. The nearest place for getting to the game Sanctuary is Dholpur (35 km) and Van-Bihar (16 km).	A variety of indigenous birds and wild animals, particularly tigers, panthers, bison, sambhar, cheetal, nilgai, chinkara and pigs, inhabit the sanctuary.
	6. The Ban-Vihar Game Sanctuary (1955).	8	20	Located 32 km away from Dholpur in Bharatpur District.	
	7. The Keoladeo Ghana Sanctuary (1956).	11	28	Located 5 km from Bharatpur.	The most famous water-bird sanctuary in India. From July to October, it is a breeding place for the non-migratory water-birds which come from different parts of India. During November to March, about 75 species of migratory birds come here from far off places, including Siberia, China, Japan etc. Wild Life include painted storks, spoonbills, egrets, grey herons, Indian darters (snake-birds), open-bill storks, Sarus cranes, cormorants, coots, peafowl, etc.
	8. Mt. Abu Sanctuary (1960).	60	155	The forest reserve around Mt. Abu in Sirohi Distt. is a sanctuary. Mt. Abu is accessible by road from Abu Road station on the western railway.	
XIV. Uttar Pradesh	1. Rajaji Sanctuary (1948).	173	450	Located in the Siwaliks of the Saharanpur Forest Division and on the Dehra Dun-Delhi Road.	Main species found are sambhar, cheetal, barking deer, tiger, leopard, pig, bear, jungle fowl and peafowl, etc.
	2. The Kansrao Sanctuary (1935).	292	760	Situated in Dehra Dun Division. A good road passes through the area as also the Rly. line from Hardwar to Dehra Dun with Kansrao station in the centre.	
	3. The Nandā Devi Sanctuary (1939).	125	320	Situated in the Garhwal District, and in the catchment of the Rish Ganga above its junction with Bagini Gal in Kumaon.	

4. The Chandraprabha Sanctuary.	30	80	Situated in Chakia forest, 70 km from Varanasi.	It is being developed as a new home for the lion, within the former range of the lion. One lion and two lionesses were released in December, 1957.
5. The Malan Sanctuary.	32.48	85	In the Lansdowne Forest Division. The Sanctuary is on the road from Chini to Kotdwara.	
6. The Jaulasal Sanctuary.	21.2	55	Situated in the Haldwani Forest Division, Naini Tal. It is 32 km from Haldwani on the Tanakpur road.	
7. The Maldhan Sanctuary.	7.2	20	Situated in the Tarai and Bhabar Division, Naini Tal and is approachable from Ramnagar (NER).	Known for tiger, leopard, gond bear, sambhar, cheetal, parakakar, pig, peafowl, pheasant, jungle fowl, partridge, etc.
8. The Tanda Sanctuary.	4.7	12	Located in the Tarai and Bhabar Division, Naini Tal. The nearest place to the Sanctuary is Lalkua.	
9. The Sonaripur Gond Sanctuary.	24.63	60	Located in the North Kheri Forest Divn., Lakhimpur-Kheri Distt. Accessible from Sonaripur (NER).	
10. The Govind Pashu Vihar.	368	950	Situated in the Tons Forest Div., Tehri Garhwal. It is approachable from Dehra Dun, Chakrata, from where a mule track following the Upper Simla road for some distance via Mundali is to be taken. It is remote and difficult of access.	Known for leopard, snow leopard, black and brown bear, thar, serow and cheer and monal pheasants.
XV. West Bengal				
1. The Senchal Sanctuary (1940).	15.27	40	Situated in the Senchal and Takdah ranges of Darjeeling Division.	Barking deer, bear and birds are commonly seen.
2. The Gorumara Sanctuary (1949).	3.30	8.5	Situated in the Lataguri Sub-division of Jalpaiguri, 11 km from Chalsa and Lataguri Station.	Mainly for rhinoceros.
3. The Chapramari Sanctuary (1939).	3.40	9	Situated within the Upper Tonda Range of Jalpaiguri Division, between Chalsa and Nagrakata Rly. Stations.	For rhinoceros and other species.

1	2	3	4	5	6
XV. West Bengal—Contd.	4. The Jaldapara Sanctuary (1941).	36	90	Situated in Jalpaiguri Distt. in the Nilpara range of Cooch-Bihar Division about 2 km from Hasimara station to the east and a similar distance from Madarihat station in the west.	The sanctuary is mainly for rhinoceros which are estimated to be some 30 in number.
	5. The Lothian Island Sanctuary (1948).	14.67	40	Situated in Sunderbans Forest of 24-Parganas district, in the delta of the Hooghly river. The nearest railway station is Diamond Harbour, 80 Km by river.	The fauna is mainly cheetal and pig and occasionally tiger.
	6. The Mahanadi Sanctuary (1955).	49.10	130	Situated in the foothills of the Darjeeling district, north of Silliguri Town in Kurseong Division.	Mainly for bison and cheetal.
	7. Sajnakhali Sanctuary (1960).	139.92	360	In Sunderbans R.F. of 24-Parganas District.	For Royal Bengal Tiger and other species. In June-July, August which is the breeding season it contains up to 15,000 birds.
	8. Halliday Island Sanctuary.	2.3	6	Do.	For Royal Bengal Tiger and other species.
<i>Centrally Administered Territories</i>					
	Notified—				
XVI. Himachal Pradesh	1. Sechu-tun-Nalha,	14.81	38.37	Chamba District, Pangi Forest Division.	For Tahr. Brown-bear, Black-bear, Ibex, Ghoral, Barking-deer, Tragopan, Snow-cock, Monal and Chukor are also found.
	2. Gamgul & Siya.	34.84	90.23	Chamba District, Churah Forest Division.	For Kashmir-stag and Tahr. Brown bear, Musk-deer, Ghoral, Barking-deer, Monal, Snowcock, Tragopan, Chukors and Partridges are also found.
	3. Tundah.	24.84	64.34	Chamba District, Chamba Forest Division.	Tahr and Snow-cock. Brown bear, Musk-deer, Ghoral, Black-bear, Koklash, Tragopan, Chukors and Partridges are also found.

4. Kugti.	45·73	118·49	Chamba District, Chamba Forest Division.	For Ibx and Snow-Leopard. Tahr, Musk deer, Brown-bear, Koklash, Monal, Tragopan, Chuckors and Partridges are also found.
5. Kalatop & Khajjiar.	18·28	47·36	Do.	For Koklash, Ghoral and Serow. Black bear, Foxes, Flying squirrels and Monal are also found.
6. Shikari-devi.	82·56	213·87	Mandi District, Mandi and Suket Forest Division.	For Musk-deer and Monal. Black bear, Barking-deer, Koklash, Partridges, Kalij pheasant are also found.
7. Nargu-Winch Camp.	107·66	278·85	Mandi District, Mandi Forest Division.	Musk-deer and Cheer pheasants. Palm Civet, Serow, Ghoral, Barking-deer, Tragopan, Chuckors, Kalij pheasants are also found.
8. Bandlii.	16·06	41·40	Mandi District, Suket Forest Division.	For Ghoral. Black-bear, Red-Jungle fowls, Cheer pheasants etc., are also found.
9. Govind Sagar.	40·50	103·60	Bilaspur District, Bilaspur Forest Division.	For Wild ducks and aquatic birds.
10. Shri Naina Devi.	63·17	163·63	Do.	Barking-deer, Red-Jungle-Fowl and Partridges. Barking-deer, Sambhar, Wild boar, Kalij pheasants, and Chuckors are also found.
11. Kajathal Harsang.	35·60	92·22	Mahasu District, Kunihar Forest Division.	For Ghoral & Cheer-pheasants. Barking-deer, Sambhar, Wild boar, Kalij Pheasants, Red-fowls and Chuckors are also found.
12. Darlaghat.	17·14	44·40	Do.	For Chuckors. Partridges are also seen.
13. Shilli.	0·73	1·89	Do.	For Ghoral, Barking-deer, Red-jungle-fowl. Partridges, Foxes, Pine-martins and Panthers are also found.
14. Water-Supply-catchment area.	3·96	10·26	Mahasu District, Simla Forest Division.	Kalij pheasants. Barking-deer Ghoral, Serow, Musk-deer, Sambhar, Monal, Cheer, Koklash, Turtle doves.
15. Talra.	29·46	76·30	Mahasu District, Jubble Forest Division.	For Musk-deer. Monal, and Koklash. Kashmir-stag, Black-bear, Ghoral, Serow, Flying-squirrels, Civet cats and Koklash are also found.

APPENDIX 1-A—*contd.*

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1	2	3	4	5	6
XVI. Himachal Pradesh— <i>Contd.</i>	16. Dharan-ghati I & II.	64·74	167·68	Mahasu District, Sarahan Forest Division.	For Musk-deer, Serow and Tragopan. Ghoral, Tahr, Clouded-leopard, Barking-deer, Monal, Koklash, Chuckors, Snow-pigeons are also found.
	17. Rakchum & Chitkul.	63·69	139·08	Kinnaur District, Kinnaur Forest Division.	For Bharal or Blue-sheep and Snow-cock. Ibex, Black & Brown-bear, Musk-deer, Snow-leopard, Weasels, Monals, Chuckors, Koklash, Snow-pigeons are also found.
	18. Lipka-Asrang.	42·20	109·30	Do.	For Bharal, Ibex, Snow-cock. Black & Brown-bear, Musk-deer, Snow-leopard, Weasels, Monals, Chuckors, Koklash, Snow-pigeons are also found.
	19. Renuka.	5·20	13·47	Sirmur District, Rajgarh Forest Division.	For Red-jungle-fowl, Kalij pheasants and Barking-deer. Pea-cocks, Partridges, aquatic birds, Crocodiles, Ghorals, Sambhar, and Spotted-deer are also found.
	20. Simbalbara.	21·41	55·46	Sirmur District, Nahan Forest Division.	For Spotted and Sambhar. Red-jungle-fowls, Kalij pheasants and Partridges are also found.

APPENDIX 1-B
List of National Parks

Sl. No.	Name of the State (In alphabetical order)	Name of the National Park (year of formation)	Area		Location	Remarks
			Sq miles	Sq km		
1	2	3	4	5	6	7
1.	Bihar	Hazaribagh (1955)	150	390	Situated 16 km north-west of Hazaribagh on the Patna-Ranchi Road.	Wild Life including tiger, leopard, bear, sambhar, barking-deer.
2.	Bihar	Palamau	65	170	In Palamau District, 16 km south-east of the Ranchi-Dal-tonganj Road.	Proposed.
3.	Gujarat	Balaram	..	..	Banaskanth District.	Do.
4.	Madhya Pradesh	Kanha (1956)	97.7	253	Situated in the Banjar Valley in the heart of the semi-ever-green sal forests of the central high lands of Mandla. It can be reached by road (Mandla-Jabalpur 152 km, Nagpur 270 km) and by rail (Mandla Fort 56 km, Chiraidongri 43 km, Balaghat-Muki).	Vast amphitheatre covered with forests in Upper Banjar valley. Abundant wild life including tiger, gaur, sambhar, axis deer, muntjack etc. One of the best places for seeing tiger. Famous for swamp deer (or barasingha).
5.	Madhya Pradesh	Shivpuri	61	158	In the Shivpuri District of erst-while, Gwalior State. It is approached from Gwalior from where it is 115 km south on Bombay-Agra Road.	Abundant wild life including tiger, leopard, bear, sambhar, chital, nilgai, four-horned antelope, chinkara (Indian gazelle) and varied bird life. Good place for seeing tiger.
6.	Maharashtra	Taroba (1935, 1956)	45	117	48 km north-east of Chanda Rly. Station, around Taroba Lake in W. Chanda Division.	Wild Life including tiger, leopard, sambhar, spotted deer, etc.
7.	Mysore	Venugopal	310	800	Situated in Mysore Distt. The area of this park adjoins the Mudumalai sanctuary of Madras state. The Park is combined with a "Sanctum sanctorum" of 58 sq km within the park known as the Bandipur Sanctuary.	Elephants, bison, spotted deer are very common. Best place in India for seeing and photographing gaur.

APPENDIX 1-B—contd.

1	2	3	4	5	6	7
8.	Orissa	• • • • • Similipal	350	910	In the Similipal Hills of Mayurbhanj Distt. about 68 km from Badampahar hills.	Proposed.
9.	Uttar Pradesh	• • • • • Corbett (1935)	125	325	Situated in the Kalagarh and Ramnagar Forest Divisions. It consists of the Patli Doon bordering the Ramganga river and a portion of hills to the south. The nearest rail heads are Kotdwara and Ramnagar.	Formerly known as Hailey National Park. Wild life including elephant, tiger, leopard, sloth bear, several species of deer, sambhar, goral, pig, wild dog, crocodile, python and many species of birds. One of the best places for seeing tiger.
10.	Andamans & Nicobar Islands	• Ross Island	1-92	4-9	Ross Island.	Proposed.
11.	North East Frontier Agency	• Tirap Frontier Tract National Park (1947).	802	2,077	In the extreme east of N.E.F.A. in Tirap Frontier Division, on the border of north Burma. An uninhabited "wilderness" area. The nearest station is Ledo, which is 56 km by fair weather road to Miae, beyond which the park is 16 km by footpath.	Not yet explored, on account of its remoteness and difficult terrain. Known to contain the great Indian one-horned rhinoceros.

APPENDIX I-C

List of Fishing Reserves and Hatcheries

Name of the State	Name of the National Park (Year of formation)	Location	Remarks
1	2	3	4
FISHING RESERVES			
Himachal Pradesh	1. Trout Angling Reserve on river Pabar in Mahasu District.	From Sandaur Village Upstream.	Approximate river length 30 km.
	2. Trout Angling Reserve on river Uhl in Mandi Distt.	..	Approximate river length 56 km.
	3. Trout Angling Reserve on river Baspa in Kinnaur District.	..	Approximate river length 30 km.
FISH HATCHERIES			
Himachal Pradesh	1. Barot, District Mandi	For Trout.	
	2. Chirgaon, District Mahasu	Do.	
	3. Sangla, District Kinnaur	Do.	
	4. Nahan, District Sirmur	For Mirror Carp.	
	5. Deoli, District Bilaspur	Do.	

APPENDIX I-D

List of Zoological Gardens and Parks in India

Sl. No.	State	Name of Garden or Park
1.	Andhra Pradesh	Zoological Gardens, Hyderabad.
2.	Assam	State Zoo, Gauhati.
3.	Delhi	Delhi Zoological Park.
4.	Gujarat	Zoological Hill Garden, Ahmedabad.
5.	Gujarat	Sayaji Rao Garden Zoo, Baroda.
6.	Gujarat	Zoological Garden, Junagadh.
7.	Kerala	Zoological Garden, Trivandrum.
8.	Kerala	Zoological Garden, Trichur.
9.	Madhya Pradesh	King George Zoological Park, Lashkar (Gwalior).
10.	Madras	Zoological Gardens, Madras.
11.	Maharashtra	Victoria Garden Zoo, Bombay.
12.	Maharashtra	Peshwa Park Zoo, Poona.
13.	Maharashtra	Maharaj Bag Zoo, Nagpur.
14.	Mysore	Shri Chamarajendra Zoological Gardens, Mysore.
15.	Rajasthan	Zoological Garden, Jaipur.
16.	Rajasthan	Zoological Garden, Jodhpur.
17.	Rajasthan	Zoological Garden, Kotah.
18.	Rajasthan	Zoological Gardens, Bikaner.
19.	Rajasthan	Zoological Gardens, Udaipur.
20.	Uttar Pradesh	Zoological Gardens, Lucknow.
21.	West Bengal	Zoological Gardens, Alipore, Calcutta.
22.	West Bengal	Himalayan Zoological Park, Darjeeling.

APPENDIX II

Wild Life Conservation and Management—Table showing number of National Parks, Game Sanctuaries, Shooting Blocks, etc.

Sl. No.	Name of State	No. of National parks and State parks	No. of Game sanctuaries	No. of Shooting blocks	Other information
1	2	3	4	5	6
1.	Andhra Pradesh	1	7	40	Nehru Zoological Garden, Hyderabad.
2.	Assam	..	5	58	
3.	Bihar	2	7	227	
4.	Gujarat	1	1	..	1 Zoo at Sakkanbay in Junagadh Circle.
5.	Jammu & Kashmir	..	19	30	Including 'Rakhs.'
6.	Kerala	..	3	..	
7.	Madhya Pradesh	2	9	967 (small blocks)	Besides, 52 blocks have been closed absolutely.
8.	Madras	..	5	..	No shooting blocks. Single licence and Plural licence are issued for shooting in a single Forest Division and throughout the State respectively.
9.	Maharashtra	1	1	164	
10.	Mysore	1	5	47	18 game preserves and tiger blocks.
11.	Nagaland	..	1	..	Singloi game sanctuary on Burma border.
12.	Orissa	1	4	138	
13.	Punjab	..	25	19	
14.	Rajasthan	..	8	104	
15.	Uttar Pradesh	1	10	127	Zoo at Lucknow. Two deer parks at Saranath in Varanasi District and at Chauki Ghata in Garhwal District.
16.	West Bengal	..	8	..	Two deer parks also exist.
Total for States		10	118	1921	
<i>Union Territories :</i>					
1.	Andamans & Nicobar Islands	1	..	..
2.	Delhi	..	..	..
3.	Himachal Pradesh	..	20	508	
4.	Manipur	..	1	..	Loktak lake area 100 sq km. Important for scenic beauty and variety of bird population.
5.	Tripura	..	..	..	Proposed to create a game sanctuary during Third Plan.
6.	N.E.F.A.	1	..	..
Total for Union Territories		2	21	508	
Total for All-India		12	139	2429	

APPENDIX III

List of common game animals and birds of India, with distribution and other important information. Animals and birds marked with an asterisk are either becoming extinct or are threatened with extinction.

Sl. No.	Common Name	Scientific Name	Distribution	Remarks
1	2	3	4	5
(A) GAME ANIMALS				
(i) <i>The Cats</i>				
1	The tiger	<i>Panthera tigris</i>	Practically throughout India from the Himalayas to Cape Comorin, except in the deserts of Rajputana, the Punjab and Kutch.	
*2	The lion	<i>Panthera leo persica</i>	It was once found over the whole of Northern and Central India as far south as the Narmada. It is now restricted to the Gir forests in Kathiawar (Gujarat).	As it is threatened with extinction, the Gir forest was created as a Sanctuary in 1900.
3	The Leopard or Panther	<i>Panthera pardus</i>	Punjab, Himachal Pradesh, Kashmir and over the whole country.	
*4	The Chectah or Hunting Leopard	<i>Acinonyx jubatus venaticus</i>	Once found in the plains and lower hills of Northern and Central India as far down as the Deccan and Mysore. Now believed extinct.	
*5	The Clouded Leopard	<i>Neofelis nebulosa macrosceloides</i>	Sikkim, Bhutan and Assam.	
*6	The Snow Leopard or Ounce	<i>Panthera (Uncia) uncia</i>	In the Himalayas from Kashmir to Sikkim, at altitudes of 3500-4000 m ; descends to lower altitudes during winter.	
7	The Leopard Cat	<i>Felis (Prionailurus) bengalensis</i>	Punjab.	
8	The Indian Desert Cat	<i>Felis libyca ornata</i>	The desert of north-west India extending up to the drier parts of Central India.	
9	The Jungle Cat	<i>Felis chaus</i>	All over the country from the Himalayas to Cape Comorin.	
*10	The Caracal	<i>Felis caracal schmitzi</i>	Common in the North and North-West hills of Kutch. Also in drier parts of Punjab, Rajputana, Uttar Pradesh and Central India.	
11	The Lynx	<i>Felis lynx isabellina</i>	Punjab, Himachal Pradesh and Kashmir.	

(ii) *The Civets*

- | | | | | |
|----|------------------------------------|-------|-----------------------------------|---|
| 12 | The Large Indian Civet | • • • | <i>Viverra zibetha</i> | North Bengal, Sikkim, Bhutan, and Assam. |
| 13 | The Small Indian Civet | • • • | <i>Viverricula indica</i> | Throughout India and abundant in Dharwar and Coorg. |
| 14 | The Common Palm-Civet or Toddy Cat | • • • | <i>Paradoxurus hermaphroditus</i> | Kashmir, the Himalayas and Assam, southwards through the whole of Peninsula, except in the desert zone. |

(iii) *The Mongooses*

- | | | | | |
|----|----------------------------|-------|--------------------------------|--|
| 15 | The Small Indian Mongoose | • • • | <i>Herpestes auropunctatus</i> | Northern India from Kashmir to Bengal, Orissa and Assam, southwards to Gujarat. |
| 16 | The Indian Grey Mongoose | • • • | <i>Herpestes edwardsi</i> | The whole of India, from the Himalayan foot hills to Cape Comorin. |
| 17 | The Stripe-necked Mongoose | • • • | <i>Herpestes vitticollis</i> | The Western Ghats, from North Kanara and southwards to some of the adjoining Indian hills. |

(iv) *The Dog Tribe*

- | | | | | |
|-----|----------------|-------|---------------------------|--|
| *18 | The Wolf | • • • | <i>Canis lupus</i> | Kashmir and Punjab, extending up to the desert zone and dry open plains of Peninsular India. |
| 19 | The Jackal | • • • | <i>Canis aureus</i> | Throughout India. |
| 20 | The Indian Fox | • • • | <i>Vulpes bengalensis</i> | The whole of India from the Himalayas to Cape Comorin. |
| 21 | The Wild Dog | • • • | <i>Cuon alpinus</i> | Throughout the forest regions of India. |

(v) *Hyaena*

- | | | | | |
|----|--------------------|-------|----------------------|---|
| 22 | The Striped Hyaena | • • • | <i>Hyaena hyaena</i> | Almost the whole of India, from lower Kashmir to Nepal, the Terai, from Rajasthan eastwards to lower Bengal and from Kutch southwards to the Nilgiris, probably up to Cape Comorin. |
|----|--------------------|-------|----------------------|---|

(vi) *Bears*

- | | | | | |
|----|----------------|-------|-------------------------|--|
| 23 | The Sloth Bear | • • • | <i>Melursus ursinus</i> | The forested tracts of Peninsular India and Assam, from the base of the Himalayas to Ceylon. |
|----|----------------|-------|-------------------------|--|

1	2	3	4	5
24	The Himalayan Black Bear	Selenarctos thibetanus		Punjab, Himachal Pradesh, Kashmir, Himalayas and Assam.
25	The Brown Bear	Ursus arctos		Higher levels of north-western and Central Himalayas.
		(vii) Pigs		
26	The Indian Wild Boar	Sus cristatus		Punjab, Himachal Pradesh, Kashmir and nearly the whole of India.
		(viii) The Wild Sheep and Goa		
27	The Urial or Shapo	Ovis orientalis punjabiensis		Punjab, Kashmir, Gilgit, Aster and Ladakh.
28	The Nayan or Great Tibetan Sheep	Ovis amon hodgsoni		Punjab, Himachal Pradesh, and Ladakh.
29	The Bharal or Blue Sheep	Pseudois nayaur		Punjab, Himachal Pradesh, and Kashmir.
30	The Himalayan or Asiatic Ibex	Capra ibex sibirica		Punjab, Himachal Pradesh, and Kashmir. In Kumaon a different race occurs.
31	The Markhor	Capra falconeri		Kashmir and parts of Himachal Pradesh and Punjab.
32	The Himalayan Tahr	Hemitragus hylocrius		From the Nilgiris to the Anamalais and south-wards along the Western Ghats at elevations from 1220 to 1520 m.
33	The Nilgiri Tahr	Hemitragus jemlahicus		Punjab, Himachal Pradesh, and Kashmir to Sikkim in the Himalayas.
		(ix) Goat-Antelopes		
34	The Grey Himalayan Goral	Nemorhadus goral goral		Punjab, Himachal Pradesh, Kashmir and Kumaon.
35	The Brown Goral	Nemorhadus goral hodgsoni		Eastern Himalayas to Assam.
36	The Scrow	Capricornis sumatrensis		The Himalayas, from Kashmir to Mishmi Hills in Assam.

(x) *Antelopes*

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|-----|-----------------------------------|----------------------------|--|
| *37 | The Indian Antelope or Black Buck | · Antelope cervicapra | Punjab, Kashmir, Uttar Pradesh and practically all over the Indian plains except the Malabar coast. They avoid the hills. |
| 38 | The Four-horned Antelope | · Tetracerus quadricornis | Not a true antelope. Punjab, Peninsular India, South of Himalayas, where the country is wooded and hilly but not too densely forested. Not found on the Malabar coast. |
| *39 | The Indian Gazelle | · Gazella gazella bennetti | The plains and lesser hills of North-western and Central India, extending through the open lands of the Deccan to a little south of the Krishna river. |
| 40 | Blue-Bull | · Boselaphus tragocamelus | Peninsular India, from the base of the Himalayas to Mysore, in Eastern Punjab, Gujarat and parts of Bombay. |

(xi) *The Deer*

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|-----|------------------------|--------------------------------|--|---|
| *41 | Kashmir Stag | · Cervus elaphus hanglu | Limited to north of the valley of Kashmir and some adjacent valleys. | As the animal is threatened with extinction, its habitats, e.g., Dachigam and Chumania basin have been declared as sanctuaries. |
| *42 | The Brow-antlered Deer | · Cervus (Panolia) eldi eldi | Manipur. | As the animal is threatened with extinction, its habitat, Keibul Lamjao has been declared as a sanctuary. |
| *43 | The Swamp Deer | · Cervus (Rucervus) duvaucelli | Limited to India. Two races are recognised. The swamp dwelling animal of Terai, Uttar Pradesh and Assam and the Sunderbans distinguished by its splayed hoof and larger skull, and the form found in hard open ground of Madhya Pradesh with smaller and well knit hoof. | |
| 44 | The Sambhar | · Cervus (Rusa) unicolor nigra | The wooded districts of India. | |
| *45 | The Hog Deer | · Axis porcinus | The low alluvial grass plains of North India, from Punjab to Assam. It is not found in the Indian Peninsula. | |

1	2	3	4	5
46	The Spotted Deer	• Axis axis	In the forests at the base of the Himalayas upto western Assam and practically throughout the peninsula, wherever there is jungle combined with good grazing and plentiful supply of water. It is unknown in the arid plains of the Punjab and a large portion of Rajputana, in eastern Assam and the countries east of the Bay of Bengal.	
47	The Muntjac or Barking Deer	• Muntiacus muntjak	All over India.	
*48	The Musk Deer	• Moschus moschiferus	Kashmir, Punjab and Himachal Pradesh up to Kumaon in the Himalayas.	
49	The Indian Chevrotain or Mouse-Deer.	• Moschiola memina	Forested areas of south India at an elevation up to 1,830 m. (6,000 ft.) The 24° latitude is approximately the limit of its northerly range in the Peninsular area.	
(xii) <i>The Wild oxen and Buffaloes</i>				
50	The Bison	• Bos (Bibos) gaurus gaurus	The hill forests of India in the east and south. It is said to be found in the hills of Manipur, but whether any herds exist there at present is not known.	
*51	The Indian Buffalo	• Bubalus bubalis	The grass jungles of the Nepal Terai and the plains of the Ganges and Brahmaputra in Assam. A few herds survive in parts of Orissa, adjoining the Raipur district of Madhya Pradesh and in the former State of Bastar.	
(xiii) <i>The Weasel Tribe</i>				
52	The Common Otter	• Lutra lutra	Punjab, Kashmir, the Himalayas and Assam.	
53	The Himalayan yellow-throated Marten	• Martes (Charronia) flavigula	The Himalayas and the Assam Hill ranges.	
54	The Himalayan Weasel	• Mustela sibirica	The Himalayas.	

55	The Ratel or Honey Badger	<i>Melivora capensis</i>	From the base of Himalayas to Cape Comorin.
		(xiv) <i>Insectivores</i>	
56	The Indian Hedgehog	<i>Paraechinus micropus</i>	Plains of south India.
		(xv) <i>Pangolins</i>	
57	The Indian Pangolin or Scaly Ant-Eater	<i>Manis crassicaudata</i>	Plains and lower hill-slopes of India, south of the Himalayas.
		(xvi) <i>The Rodents</i>	
58	Large Brown Flying Squirrel	<i>Petaurista petaurista philippensis</i>	Forests of Peninsular India.
59	The Red Flying Squirrel	<i>Petaurista petaurista albiventer</i>	Western Himalayas.
60	The Indian Giant Squirrel or Malabar Squirrel.	<i>Ratufa indica</i>	Deciduous, mixed deciduous and moist evergreen forests of Peninsular India, south of the Ganges.
61	The Indian Crested Porcupine	<i>Hystrix leucura</i>	From the Himalayas to Cape Comorin.
62	The Common Hare	<i>Lepus nigricollis ruficaudatus</i>	From the Himalayas southwards to the Godavari.
63	The Black-naped Hare	<i>Lepus nigricollis nigricollis</i>	Peninsular India to the Godavari on the east and as far north as Khandesh and the western districts of Madhya Pradesh.
64	The Desert Hare	<i>Lepus nigricollis dayanus</i>	Punjab, Kutch, Rajputana and Kathiawar.
		(xvii) <i>Elephant</i>	
65	The Indian Elephant	<i>Elephas maximus</i>	Assam, Bengal, Uttar Pradesh, Mysore, Bihar, Kerala and Madras.
		(xviii) <i>The Horses and Rhinoceroses</i>	
*66	The Great One-horned Rhinoceros	<i>Rhinoceros unicornis</i>	Restricted to Assam plains, but moves into the foot hills. In North Bengal also. As this is threatened with extinction, the Kaziranga Sanctuary was created in 1908.
*67	The Indian Wild Ass	<i>Equus hemionus khur</i>	The Rann of Kutch and parts of the desert zone of north-west India.

1	2	3	4	5
(B) GAME BIRDS				
1	The Great Indian Bustard	<i>Choriotis nigriceps</i>	Punjab south through Rajasthan, Gujarat, M.P. and Hyderabad to Madras and Mysore. Casual in U.P., Bihar, West Bengal and Orissa. Now rare and decreasing. Mainly restricted to Rajasthan and Gujarat.	Resident but also local migrant. Bird of dry areas. First rate sporting bird and excellent eating.
2	The Chikor or Chukor	<i>Alectoris graeca</i>	Himalayas from Ladakh into central Nepal, and hill ranges of the Punjab from the foot-hills to 4,880 m.	
3	The Common Coot	<i>Fulica atra</i>	Practically throughout India, including Assam upto about 2,438 m in outer Himalayas.	Resident, but also a winter visitor.
4	The Common Crane	<i>Grus grus</i>	Visits India in enormous numbers during winter (Oct.-Mar.).	Considered very good eating.
5	The Demoiselle Crane	<i>Anthropoides virgo</i>	In winter (Oct.-March), common throughout Northern India down to Mysore. South of the Deccan it is rare. It also visits Assam.	Considered very good eating. Winter visitor.
6	The Sarus Crane	<i>Grus antigone</i>	Punjab, east to Assam and Manipur ; south to the Godavari.	
7	The Spotted Dove	<i>Streptopelia chinensis</i>	Throughout India.	
8	The Indian Ring Dove	<i>Streptopelia decaocto</i>	Throughout the drier parts of India.	
9	The Comb Duck or Nukta	<i>Sarkidiornis melanotos</i>	Practically throughout India.	
10	The Cotton Teal	<i>Nettapus coromandelianus</i>	Throughout India.	
11	The Whistling Teal	<i>Dendrocygna javanica</i>	Throughout India.	
12	The White-winged Wood Duck	<i>Cairina scutulata</i>	Assam.	
13	The Pink-headed Duck	<i>Rhodonessa caryophyllacea</i>	Formerly in U.P., Bihar, Bengal, and Assam. Not authentically reported since the mid 1930s.	
14	The Gadwall	<i>Anas strepera</i>	Wintering bird from Punjab to Assam, gradually decreasing southwards.	Most commonly and abundantly netted for food.
15	The Common Teal	<i>Anas crecca</i>	Throughout India in winter.	Most commonly and abundantly netted for food.

16	The Garganey or Blue-winged Teal	<i>Anas querquedula</i>	Winters throughout India.	Most commonly and abundantly netted for food.
17	The Ruddy Sheldrake or the Brahminy Duck.	<i>Casarca ferruginea</i>	Common. Do not breed in the plains of India.	
18	The Pintail	<i>Anas acuta</i>	Winters all over India.	Most commonly and abundantly netted for food.
19	The Bengal Florican	<i>Eupodotis benghalensis</i>	Kumaon, east through Bihar, Bengal and Assam.	
20	The Lesser Florican or Likh	<i>Sypheotides indica</i>	Northern India. South to northern Madras.	
*21	The Bar-headed Goose	<i>Anser indicus</i>	In winter, it is fairly common throughout northern India and Assam, and in small numbers straggles as far south as Mysore. A separate race is found in south India.	Migratory. Netted for sale in city markets. It keeps to rivers and <i>jheels</i> and does damage to young winter crops.
22	The Mallard	<i>Anas platyrhynchos</i>	Northern India.	
23	The Purple Moorhen	<i>Porphyrio poliocephalus</i>	Practically throughout the plains of India.	
24	The Grey Jungle fowl	<i>Gallus sonneratii</i>	The forested portions of Central India, roughly from Baroda to Mt. Abu on the west to the mouth of Godavari on the east and throughout South India in Cape Comorin.	Highly esteemed as food, and enjoy a ready demand everywhere. Extensively shot for sport. Snared and brought to nearby markets but not on any extensive scale.
25	The Red Jungle fowl	<i>Gallus gallus</i>	The Indian race <i>murghi</i> is resident in North India and Assam, chiefly in the belt of Himalayan Terai-Bhabar and foothills upto 1,520 m and south to Godavari river.	Ancestor of all domestic breeds. Highly esteemed as food, and enjoys a ready demand everywhere. Extensively shot for sport. Snared and brought to nearby markets but not on any extensive scale.
26	The Black Partridge	<i>Francolinus francolinus</i>	Resident throughout North India (commonly upto 1,520 m in western Himalayas east to Manipur and Assam.	Edible wild bird sold in Indian markets. Affords good sport.
27	The Grey Partridge	<i>Francolinus pondiccranus</i>	Resident in drier portions mostly plains throughout India upto 1520 m in the Himalayas, East Bengal and south to Cape Comorin.	Edible wild bird sold in Indian markets. It is popular cage bird, prized for its fighting qualities and affords good sport.
28	The Painted Partridge	<i>Francolinus pictus</i>	North-Central India, south to Coimbatore and Assam.	Edible wild bird sold in Indian markets. Affords good sport.
29	The Common Hill Partridge	<i>Arborophila torqueola</i>	Punjab hills, and Himachal Pradesh eastwards to Assam.	
30	The Himalayan Snow Cock	<i>Tetraogallus himalayensis</i>	Himalayas above the tree line.	

APPENDIX III—contd.

1	2	3	4	5
31	The Common Peafowl	<i>Pavo cristatus</i>	Throughout India except in the extreme north-west. Locally up to 1,520 m in Himalayas. Absent from north-east Assam.	They keep down snakes and other poisonous reptiles. When young, they are good for eating.
32	The Blue Rock Pigeon	<i>Columba livia</i>	Throughout India.	
33	The Nilgiri Wood Pigeon	<i>Columba elphinstonii</i>	Nilgiris and other south Indian hills.	
34	The Common Green Pigeon	<i>Crocopus phoenicopterus</i>	Almost throughout India.	Green Pigeons are much sought after by sportsman, and also snared or lured and brought to bird markets though never in considerable numbers.
35	The Kalij Pheasant	<i>Lophura leucomelana</i>	Most widely distributed pheasant in the Himalayas ; one form in Assam.	
36	The Cheer Pheasant	<i>Catreus wallichii</i>	Western Himalayas from 1,200 to 3,400 m.	Among the best of game birds for the table.
37	The Impeyan or Monal Pheasant	<i>Lophophorus impejanus</i>	Himalayas from Kashmir to Bhutan from 2,130 m to the forest limit.	Purchased by fanciers more for aviaries than for the edible qualities of their flesh.
38	The Koklash Pheasant	<i>Pucrasia macrolopha</i>	Western Himalayas above 1,830 m.	
39	The Black breasted or Rain Quail	<i>Coturnix coromandelicus</i>	Throughout India upto 1,830 m in the Himalaya including Assam.	Netted on a large scale and may usually be had in most bird markets.
40	The Common Quail	<i>Coturnix coturnix</i>	Over greater part of North and Central India and east to Manipur. Migrant in winter, south to the Nilgiris hills.	
41	The Jungle Bush Quail	<i>Perdicula asiatica</i>	Throughout India upto 1,220 m.	Netted on a large scale and may usually be had in most bird markets.
42	The Button Quail	<i>Turnix tanki</i>	Practically throughout India.	
43	The Imperial Sandgrouse	<i>Pterocles orientalis</i>	Lower Punjab and Rajasthan and south to Kutch and Saurashtra.	Excellent sport can be had as the birds fly at their appointed time (a couple of hours after sunrise and again a little before dusk); to and from their drinking ground.
44	The Painted Sandgrouse	<i>Pterocles indicus</i>	Throughout India excluding the Gangetic plain, Assam and the West Coast.	Do.

45	The Common Indian Sandgrouse	Pterocles exustus	From Kashmir east to Bihar, south to Kerala.	Do.
46	The Wood Snipe	Gallinago nemoricola	Breeds in the Himalayas from Dalhousie east, from above 600 m. Winters from Lower Himalayas south to the hills of South India.	
47	The Fantail Snipe	Capella gallinago	A winter (Sept.-April) migrant visiting practically the whole of India. Breeds in Kashmir.	
48	The Pintail Snipe	Gallinago stenura	Common in eastern and southern India during winter (Sept.-April).	
49	The Jack Snipe	Gallinago minima	Common in eastern and southern India during winter.	
50	The Painted Snipe	Rostratula benghalensis	The race <i>benghalensis</i> occurs throughout India and upto 1,520 m in the Himalayas. Resident, but also local.	
51	The Wood Cock	Scolopax rusticola	Almost throughout India, mostly in the hills. Breeds in the Himalayas. Winter migrant to the Nilgiris and adjacent hills in small numbers, the majority being resident in the Himalayas and merely moving down to lower levels in winter.	

APPENDIX IV

List of Game Animals and Birds of India (Common names alphabetically arranged with scientific names)

Common name	Scientific name
‘ A ’	
Ant-eater, Scaly or Pangolin	Manis crassicaudata.
Antelope, Four-horned (<i>Chousingha</i>)	Tetracerus quadricornis.
Antelope, Indian or Black Buck	Antilope cervicapra.
Asiatic ibex (or Himalayan)	Capra ibex sibirica.
Ass, Indian wild	Equus hemionus khur.
‘ B ’	
Badger, Honey or Ratel	Melivora capensis.
Bear, Brown	Ursus arctos.
Bear, Himalayan black	Selenarctos thibetanus.
Bear, Sloth	Melursus ursinus.
Bengal Florican	Eupodotis benghalensis.
Bengal Fox	Vulpes bengalensis.
Bharal or Blue sheep	Pseudois nayaur.
Bison, Indian (<i>Gaur</i>)	Bos gaurus gaurus.
Black buck	Antilope cervicapra.
Blue bull (<i>Nilgai</i>)	Boselaphus tragocamelus.
Boar, Indian wild	Sus cristatus.
Brahminy duck or ruddy sheldrake	Casarca ferruginea.
Buck, black or Indian antelope	Antilope cervicapra.
Buffalo, Indian	Bubalus bubalis.
Bull, blue (<i>Nilgai</i>)	Boselaphus tragocamelus.
Bustard, great Indian	Choriotis nigriceps.
‘ C ’	
Caracal	Felis caracal schmitzi.
Cat, Golden or Temminck's	Felis temmincki.
Cat, Indian desert	Felis ornata.
Cat, fishing	Felis viverrina.
Cat, jungle	Felis chaus.
Cat, leopard	Felis (Prionailurus) bengalensis.
Cat, marbled	Felis marmorata.
Cat, rusty-spotted	Felis rubiginosa.
Cat, toddy or common palm civet	Paradoxurus hermaphroditus.
Cheetah or hunting leopard	Acinonyx jubatus venaticus.
Cheetal	Axis axis.
Chevrotain, Indian or mouse deer	Moschiola memina.
Chikor or chukor	Alectoris graeca.
Chinkara (Indian gazelle or ravine deer)	Gazella gazella bennetti.
Chukor or chikor	Alectoris graeca.
Civet, common palm or toddy cat	Paradoxurus hermaphroditus.
Civet, large Indian	Viverra zibetha.
Civet, small Indian	Viverricula indica.
Clouded leopard	Neofelis nebulosa macrosceloides.
Cock, Himalayan snow (<i>Ram chukor</i>)	Tetragallus himalayensis.
Cock, wood	Scolopax rusticola.
Comb, duck or nukta	Sarkidiornis melanotos.
Common otter	Lutra lutra.
Coot, common	Fulica atra.
Cormorant, intermediate	Phalacrocorax fuscicollis.

Common name	Scientific name
Cormorant, Large	Phalacrocorax carbo.
Cormorant, Little	Phalacrocorax niger.
Cotton teal	Nettapus coromandelianus.
Crane, common	Grus grus.
Crane, demoiselle	Anthropoides virgo.
Crane, sarus	Antigone antigone.
Crane, siberian	Grus leucogeranus.
' D '	
Darter, Indian	Anhinga rufa.
Deer, barking or muntjac	Muntiacus muntjak.
Deer, brow-antlered (<i>Saigai</i>)	Cervus (Panolia) eldi eldi.
Deer, hog	Axis porcinus.
Deer, mouse or Indian chevrotain	Moschiola memina.
Deer, musk	Moschus moschiferus.
Deer, ravine or Indian gazelle (<i>Chinkara</i>)	Gazella gazella bennetti.
Deer, spotted (<i>Cheetal</i>)	Axis axis.
Deer, swamp (<i>Gond</i>) or Barasingha	Cervus (Rucervus) duvaucelli.
Desert cat, Indian	Felis libyca ornata.
Dog, wild	Cuon alpinus.
Dove, emerald	Chalcophaps indica.
Dove, Indian ring	Streptopelia decaocto.
Dove, spotted	Streptopelia chinensis.
Duck, Brahminy or Ruddy Sheldrake	Casarca ferruginea.
Duck, comb or Nukta	Sarkidiornis melanotos.
Duck, pintail	Anas acuta.
Duck, shoveller	Spatula clypeata.
Duck, spotbill	Anas poecilorhyncha.
Duck, white-winged wood	Cairina scutulata.
' E '	
Eagle, Crested Hawk	Spizaetus cirrhatu.
Eagle, Crested Serpent	Spilornis cheela.
Eagle, Pallas's	Haliaeetus leucoryphus.
Eagle, Short-toed	Circaetus gallicus.
Eagle, Tawny	Aquila rapax.
Egret, Cattle	Bubulcus ibis.
Egret, Little	Egretta garzetta.
Elephant, African	Loxodonta africanus.
Elephant, Indian	Elephas maximus.
' F '	
Falcon, Laggar	Falco jugger.
Flamingo	Phoenicopterus roseus.
Florican, Bengal	Eupodotis benghalensis.
Florican, Lesser or Likh	Sypheotides indica.
Fowl, grey jungle	Gallus sonneratii.
Fowl, red jungle	Gallus gallus.
Fox, Indian	Vulpes bengalensis.
' G '	
Gadwall	Anas strepera.
Garganey or blue winged teal	Anas querquedula.
Gaur (Indian bison)	Bos gaurus gaurus.

Common name	Scientific name
Gazelle, Indian or Ravine deer (<i>Chinkara</i>)	<i>Gazella gazella bennetti</i> .
Goose, barheaded	<i>Anser indicus</i> .
Goose, greylag	<i>Anser anser rubrirostris</i> .
Goral, brown	<i>Nemorhadus goral hodgsoni</i> .
Goral, grey Himalayan	<i>Nemorhadus goral goral</i> .
‘ H ’	
Hare, black naped	<i>Lepus nigricollis nigricollis</i> .
Hare, common	<i>Lepus nigricollis ruficaudatus</i> .
Hare, desert	<i>Lepus nigricollis dayanus</i> .
Hedgehog, Indian	<i>Paracchinus micropus</i> .
Heron, grey	<i>Ardea cinerea</i> .
Heron, night	<i>Nycticorax nycticorax</i> .
Heron, pond	<i>Ardeola grayii</i> .
Heron, purple	<i>Ardea purpurea</i> .
Hog deer (<i>Para</i>)	<i>Axis porcinus</i> .
Honey badger or ratel	<i>Melivora capensis</i> .
Hunting leopard or cheetah	<i>Acinonyx jubatus venaticus</i> .
Hyaena, striped	<i>Hyaena hyaena</i> .
‘ I ’	
Ibex, Asiatic or Himalayan	<i>Capra ibex sibirica</i> .
Ibis, white	<i>Threskiornis melanocephalus</i> .
Impeyan or monal pheasant	<i>Lophophorus impejanus</i> .
‘ J ’	
Jackal	<i>Canis aureus</i> .
Jungle fowl, grey	<i>Gallus sonneratii</i> .
Jungle fowl, red	<i>Gallus gallus</i> .
‘ K ’	
Kashmir stag (<i>Hangul</i>)	<i>Cervus elaphus hanglu</i> .
Kite, Brahminy	<i>Haliastur indus</i> .
Kite, Pariah	<i>Milvus migrans</i> .
Koklash pheasant or pakras	<i>Pucrasia macrolopha</i> .
‘ L ’	
Langur, capped	<i>Trachypithecus pileatus</i> .
Langur, common	<i>Presbytis entellus</i> .
Langur, golden	<i>Presbytis geei</i> .
Langur, Nilgiri	<i>Presbytis johni</i> .
Leopard or Panther	<i>Panthera pardus</i> .
Leopard, clouded	<i>Neofelis nebulosa macroseloides</i> .
Leopard, hunting	<i>Acinonyx jubatus venaticus</i> .
Leopard, snow	<i>Panthera uncia</i> .
Leopard, cat	<i>Felis (Prionailurus) bengalensis</i> .
Likh or lesser Florican	<i>Sypheotides indica</i> .
Lion, African	<i>Panthera leo leo</i> .
Lion, Indian	<i>Panthera leo persica</i> .
Lynx	<i>Felis lynx isabellina</i> .
‘ M ’	
Mallard	<i>Anas platyrhynchos</i> .
Markhor	<i>Capra falconeri</i> .

Common name	Scientific name
Marten, Himalayan yellow throated	<i>Martes (Charronia) flavigula.</i>
Mongoose, Indian grey or common	<i>Herpestes edwardsi.</i>
Mongoose, Crab-eating	<i>Herpestes urva.</i>
Mongoose, Small Indian	<i>Herpestes auropunctatus</i> Syn. <i>H. javanicus.</i>
Mongoose, Stripe necked	<i>Herpestes vitticollis.</i>
Moorhen, Indian	<i>Gallinula chloropus.</i>
Moorhen, purple	<i>Porphyrio poliocephalus.</i>
Mouse deer or Indian chevrotain	<i>Moschiola memina.</i>
Muntjac or barking deer	<i>Muntiacus muntjak.</i>
Musk deer	<i>Moschus moschiferus.</i>
Myna, hill	<i>Gracula religiosa.</i>
' N '	
Nayan or Great Tibetan Sheep	<i>Ovis amon hodgsoni.</i>
Nilgai (Blue bull)	<i>Boselaphus tragocamelus.</i>
Nukta or comb duck	<i>Sarkidiornis melanotos.</i>
' O '	
Otter, common	<i>Lutra lutra.</i>
' P '	
Pakras or koklash pheasant	<i>Pucrasia macrolopha.</i>
Panda, red (or lesser)	<i>Ailurus fulgens.</i>
Pangolin or scaly ant-eater	<i>Manis crassicaudata.</i>
Panther or leopard	<i>Panthera pardus.</i>
Partridge, black	<i>Francolinus francolinus.</i>
Partridge, chukor	<i>Alectoris graeca.</i>
Partridge, grey	<i>Francolinus pondicerianus.</i>
Partridge, hill	<i>Arborophila torqueola.</i>
Partridge, painted	<i>Francolinus pictus.</i>
Peafowl, common	<i>Pavo cristatus.</i>
Pelican, rosy	<i>Pelecanus onocrotalus.</i>
Pelican, spot billed	<i>Pelecanus philippensis.</i>
Pheasant, blood	<i>Ithaginis cruentus.</i>
Pheasant, cheer	<i>Catreus wallichii.</i>
Pheasant, horned	<i>Tragopan spp.</i>
Pheasant, kalij	<i>Lophura lucomelana.</i>
Pheasant, koklash or pakras	<i>Pucrasia macrolopha.</i>
Pheasant, monal or impeyan	<i>Lophophorus impejanus.</i>
Pig	<i>Sus scrofa.</i>
Pigeon, blue rock	<i>Columba livia.</i>
Pigeon, common green	<i>Crocopus phoenicopterus.</i>
Pigeon, nilgiri wood	<i>Columba elphinstonii.</i>
Pintail	<i>Anas acuta.</i>
Plover, great stone	<i>Esacus magnirostris.</i>
Plover, little ringed	<i>Charadrius dubius.</i>
Pochard, red-crested	<i>Netta rufina.</i>
Pochard, white-eyed	<i>Aythya rufa.</i>
Porcupine, Indian	<i>Hystrix leucura.</i>
' Q '	
Quail, yellow legged button or Indian Button-Quail	<i>Turnix tanki.</i>
Quail, common or grey	<i>Coturnix coturnix.</i>
Quail, jungle bush	<i>Perdicula asiatica.</i>

Common name	Scientific name
Quail, mountain	<i>Ophrysia superciliosa</i> .
Quail, rain or black breasted	<i>Coturnix coromandelicus</i> .
' R '	
Rain quail	<i>Coturnix coromandelicus</i> .
Ratel or honey badger	<i>Melivora capensis</i> .
Rhinoceros, great one horned	<i>Rhinoceros unicornis</i> .
Rhinoceros, lesser (or Javan) one horned	<i>Rhinoceros sondaicus</i> .
Rhinoceros, Sumatran (or Asiatic) two horned	<i>Didermocerus sumatrensis</i> .
Ruddy sheldrake or brahminy duck	<i>Casarca ferruginea</i> .
' S '	
Sambhar	<i>Cervus (Rusa) unicolor nigra</i> .
Sandgrouse, common Indian	<i>Pterocles exustus</i> .
Sandgrouse, imperial	<i>Pterocles orientalis</i> .
Sandgrouse, painted	<i>Pterocles indicus</i> .
Serow	<i>Capricornis sumatrensis</i> .
Shapu or ural	<i>Ovis orientalis punjabiensis</i> .
Sheep, blue or bharal	<i>Pseudois nayaur</i> .
Sheep, great Tibetan or Nayan	<i>Ovis amon hodgsoni</i> .
Sheldrake, ruddy or brahminy duck	<i>Casarca ferruginea</i> .
Snipe, common or fantail	<i>Capella gallinago</i> .
Snipe, jack	<i>Gallinago minima</i> .
Snipe, painted	<i>Rostratula benghalensis</i> .
Snipe, pintail	<i>Gallinago stenura</i> .
Snipe, wood	<i>Gallinago nemoricola</i> .
Snow cock, Himalayan (<i>Ram chukor</i>)	<i>Tetragallus himalayensis</i> .
Spoonbill	<i>Platalea leucorodia</i> .
Spotted deer	<i>Axis axis</i> .
Squirrel, brown flying	<i>Petaurista petaurista philippensis</i> .
Squirrel, Indian Giant	<i>Ratufa indica</i> .
Squirrel, red flying	<i>Petaurista petaurista albiventer</i> .
Stag, Kashmir (<i>Hangul</i>)	<i>Cervus elaphus hanglu</i> .
Stork, open bill	<i>Anastomus oscitans</i> .
Stork, painted	<i>Ibis leucocephalus</i> .
Swamp deer (<i>Gond</i> or <i>Barasingha</i>)	<i>Cervus (Rucervus) duvaucelli</i> .
' T '	
Tahr, Himalayan	<i>Hemitragus jemlahicus</i> .
Tahr, Nilgiri	<i>Hemitragus hylocrius</i> .
Takin	<i>Budorcas taxicolor</i> .
Teal, common	<i>Anas crecca</i> .
Teal, cotton	<i>Nettapus coromandelianus</i> .
Teal, Garganey or blue winged	<i>Anas querquedula</i> .
Teal, whistling	<i>Dendrocygna javanica</i> .
Tiger	<i>Panthera tigris</i> .
' U '	
Urial or shapu	<i>Ovis orientalis punjabiensis</i> .
' V '	
Vulture, Black or Pondicherry or King	<i>Sarcogyps calvus</i> .
Vulture, griffon	<i>Gyps himalayensis</i> .
Vulture, white-backed	<i>Pseudogyps bengalensis</i> .

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Common name	Scientific name
' W '	
Weasel, Himalayan	Mustela sibirica.
Whistling Teal	Dendrocygna javanica.
Wild dog	Cuon alpinus.
Wood duck, white winged	Cairina scutulata.
Wolf	Canis lupus.
Wood cock	Scolopax rusticola.
' Y '	
Yak	Bos grunniens.

APPENDIX V

List of Game Animals and Birds of India
(Scientific names alphabetically arranged with common names)

Scientific name	Common name
‘ A ’	
<i>Acinonyx jubatus venaticus</i>	Cheetah or Hunting Leopard.
<i>Ailurus fulgens</i>	Red or Lesser Panda.
<i>Alectoris graeca</i>	Chikor or Chukor.
<i>Anas acuta</i>	Pintail.
<i>Anas crecca</i>	Common Teal.
<i>Anas platyrhynchos</i>	Mallard.
<i>Anas poecilorhyncha</i>	Spot bill Duck.
<i>Anas querquedula</i>	Garganey or Blue winged Teal.
<i>Anas strepera</i>	Gadwall.
<i>Anastomus oscitans</i>	Open bill Stork.
<i>Anhinga rufa</i>	Indian Darter.
<i>Anser anser rubrirostris</i>	Greylag Goose.
<i>Anser indicus</i>	Bar headed Goose.
<i>Antigone antigone</i>	Sarus Crane.
<i>Anthropoides virgo</i>	Demoiselle Crane.
<i>Antilope cervicapra</i>	Indian Antelope or Black buck.
<i>Arborophila torqueola</i>	Hill Partridge.
<i>Ardea cinerea</i>	Grey Heron.
<i>Ardea purpurea</i>	Purple Heron.
<i>Ardea grayii</i>	Pond Heron.
<i>Axis axis</i>	Spotted deer (<i>Cheetal</i>).
<i>Axis porcinus</i>	Hog deer.
<i>Aythya rufa</i>	Pochard, white-eyed.
‘ B ’	
<i>Bos gaurus gaurus</i>	Indian Bison (<i>Gaur</i>).
<i>Bos grunniens</i>	Yak.
<i>Boselaphus tragocamelus</i>	Blue bull (<i>Nilgai</i>).
<i>Bubalus bubalis</i>	Indian Buffalo.
<i>Bubulcus ibis</i>	Cattle Egret.
<i>Budorcas taxicolor</i>	Takin.
‘ C ’	
<i>Cairina scutulata</i>	White-winged wood duck.
<i>Canis aureus</i>	Jackal.
<i>Canis lupus</i>	Wolf.
<i>Capella gallinago</i>	Common or Fantail Snipe.
<i>Capra falconeri</i>	Markhor.
<i>Capra ibex sibirica</i>	Himalayan or Asiatic Ibex.
<i>Capricornis sumatrensis</i>	Serow.
<i>Casarca ferruginea</i>	Brahminy Duck or Ruddy Sheldrake.
<i>Catreus wallichii</i>	Cheer pheasant.
<i>Cervus (Rucervus) duvaucelli</i>	Swamp Deer (<i>Gond</i> or <i>Barasingha</i>).
<i>Cervus elaphus hanglu</i>	Kashmir Stag (<i>Hangul</i>).
<i>C. (Ponolia) eldi eldi</i>	Brow-antlered Deer (<i>Sangnai</i>).
<i>C. (Rusa) unicolor nigra</i>	Sambhar.
<i>Chalcophaps indica</i>	Emerald Dove.
<i>Choriotis nigriceps</i>	Great Indian Bustard.
<i>Columba elphinstonii</i>	Nilgiri wood Pigeon.

Scientific name	Common name
<i>Columba livia</i>	Blue Rock Pigeon.
<i>Coturnix coromandelicus</i>	Black breasted or Rain Quail.
<i>Coturnix coturnix</i>	Common Indian or Grey Quail.
<i>Crocopus phoenicopterus</i>	Common green Pigeon.
<i>Cuon alpinus</i>	Wild dog.
' D '	
<i>Dendrocygna javanica</i>	Whistling Teal.
<i>Didermocerus sumatrensis</i>	Sumatran or Asiatic two horned Rhinoceros.
' E '	
<i>Egretta garzetta</i>	Little Egret.
<i>Elephas maximus</i>	Indian Elephant.
<i>Equus hemionus khur</i>	Indian Wild Ass.
<i>Eupodotis benghalensis</i>	Bengal Florican.
<i>Esacus magnirostris</i>	Great Stone Plover.
' F '	
<i>Felis (Prionailurus) bengalensis</i>	Leopard Cat.
<i>Felis caracal schmitzi</i>	Caracal.
<i>Felis chaus</i>	Jungle Cat.
<i>Felis ornata</i>	Indian desert Cat.
<i>Felis lynx isabellina</i>	Lynx.
<i>Felis marmorata</i>	Marbled Cat.
<i>Felis temmincki</i>	Golden or Temminck's Cat.
<i>Felis viverrina</i>	Fishing Cat.
<i>Felis rubiginosa</i>	Rusty-spotted Cat.
<i>Francolinus francolinus</i>	Black Partridge.
<i>Francolinus pictus</i>	Painted Partridge.
<i>Francolinus pondicerianus</i>	Grey Partridge.
<i>Fulica atra</i>	Common Coot.
' G '	
<i>Gallinago minima</i>	Jack Snipe.
<i>Gallinago nemoricola</i>	Wood Snipe.
<i>Gallinago stenura</i>	Pintail Snipe.
<i>Gallinula chloropus</i>	Indian Moorhen.
<i>Gallus gallus</i>	Red Jungle fowl.
<i>Gallus sonneratii</i>	Grey Jungle fowl.
<i>Gazella gazella bennetti</i>	Indian gazelle or Ravine Deer or Chinkara.
<i>Gracula religiosa</i>	Hill Mynah.
<i>Grus grus</i>	Common Crane.
<i>Grus leucogeranus</i>	Siberian Crane.
<i>Gyps himalayensis</i>	Griffon Vulture.
' H '	
<i>Haliastur indus</i>	Brahminy Kite.
<i>Hemitragus hylocrius</i>	Nilgiri Tahr.
<i>Hemitragus jemlahicus</i>	Himalayan Tahr.
<i>Herpestes auropunctatus</i>	Small Indian Mongoose.
<i>Herpestes edwardsi</i>	Indian Grey Mongoose.

Scientific name	Common name
<i>Herpestes vitticollis</i>	Stripe-necked Mongoose.
<i>Hyaena hyaena</i>	Striped Hyaena.
<i>Hystrix leucura</i>	Indian Porcupine.
‘ I ’	
<i>Ibis leucocephalus</i>	Painted Stork.
<i>Ithaginis cruentus</i>	Blood Pheasant.
‘ L ’	
<i>Lepus nigricollis dayanus</i>	Desert Hare.
<i>Lepus nigricollis nigricollis</i>	Black naped Hare.
<i>Lepus nigricollis ruficaudatus</i>	Common Hare.
<i>Lophophorus impejanus</i>	Impeyan or Monal Pheasant.
<i>Lophura lucomelana</i>	Kalij Pheasant.
<i>Loxodonta africanus</i>	African Elephant.
<i>Lutra lutra</i>	Common Otter.
‘ M ’	
<i>Manis crassicaudata</i>	Pangolin or Scaly Ant-eater.
<i>Martes (Charronia) flavigula</i>	Himalayan Yellow throated Marten.
<i>Melivora capensis</i>	Ratel or Honey Badger.
<i>Melursus ursinus</i>	Sloth Bear.
<i>Milvus migrans</i>	Pariah Knite.
<i>Moschiola memina</i>	Chevrotain, Indian or mouse deer.
<i>Moschus moschiferus</i>	Musk Deer.
<i>Muntiacus muntjak</i>	Muntjac or Barking Deer.
<i>Mustela sibirica</i>	Himalayan Weasel.
‘ N ’	
<i>Nemorhadus goral goral</i>	Grey Himalayan Goral.
<i>Nemorhadus goral hodgsoni</i>	Brown Goral.
<i>Neofelis nebulosa macrosceloides</i>	Clouded Leopard.
<i>Netta rufina</i>	Redcrested Pochard.
<i>Nettapus coromandelianus</i>	Cotton Teal.
<i>Nycticorax nycticorax</i>	Night Heron.
‘ O ’	
<i>Ophrysia superciliosa</i>	Mountain Quail.
<i>Ovis amon hodgsoni</i>	Nayan or Great Tibetan Sheep.
<i>Ovis orientalis punjabensis</i>	Urial or Shapu.
‘ P ’	
<i>Panthera leo leo</i>	African Lion.
<i>Panthera leo persica</i>	Indian Lion.
<i>Panthera pardus</i>	Leopard or Panther.
<i>Panthera tigris</i>	Tiger.
<i>Panthera uncia</i>	Snow Leopard.
<i>Paradoxurus hermaphroditus</i>	Common Palm Civet or Toddy Cat.
<i>Paraechinus micropus</i>	Indian Hedgehog.
<i>Pavo cristatus</i>	Common peafowl.

Scientific name	Common name
<i>Pelecanus onocrotalus</i>	Rosy Pelican.
<i>Pelecanus philippensis</i>	Spot-billed Pelican.
<i>Perdica asiatica</i>	Jungle Bush Quail.
<i>Petaurista petaurista albiventer</i>	Red Flying Squirrel.
<i>Petaurista petaurista philippensis</i>	Brown Flying Squirrel.
<i>Phalacrocorax carbo</i>	Large Cormorant.
<i>Phalacrocorax fuscicollis</i>	Intermediate Cormorant.
<i>Phalacrocorax niger</i>	Little Cormorant.
<i>Phoenicopterus roseus</i>	Flamingo.
<i>Platalea leucorodia</i>	Spoonbill.
<i>Porphyrio poliocephalus</i>	Purple Moorhen.
<i>Presbytis entellus</i>	Common Langur.
<i>Presbytis geei</i>	Golden Langur.
<i>Presbytis johni</i>	Nilgiri Langur.
<i>Pseudogyps bengalensis</i>	White backed vulture.
<i>Pseudois nayaur</i>	Bharal or Blue Sheep.
<i>Pterocles exustus</i>	Common Indian Sandgrouse.
<i>Pterocles indicus</i>	Painted Sandgrouse.
<i>Pterocles orientalis</i>	Imperial Sandgrouse.
<i>Pucrasia macrolopha</i>	Pakras or Koklash Pheasant.
‘ R ’	
<i>Ratufa indica</i>	Indian Giant Squirrel.
<i>Rhinoceros sondaicus</i>	Lesser (or Javan) One-Horned Rhinoceros.
<i>Rhinoceros unicornis</i>	Great One-Horned Rhinoceros.
<i>Rostratula benghalensis</i>	Painted Snipe.
‘ S ’	
<i>Sarkidiornis melanotos</i>	Comb Duck or Nukta.
<i>Scolopax rusticola</i>	Wood Cock.
<i>Selenarctos thibetanus</i>	Himalayan Black Bear.
<i>Streptopelia chinensis</i>	Spotted Dove.
<i>Streptopelia decaocto</i>	Indian Ring Dove.
<i>Sus scrofa</i>	Fig.
<i>Sus cristatus</i>	Indian Wild Boar.
<i>Sypheotides indica</i>	Lesser Florican or Likh.
‘ T ’	
<i>Tetracerus quadricornis</i>	Four-horned Antelope (<i>Chousingha</i>).
<i>Tetragallus himalayensis</i>	Himalayan Snow Cock (<i>Ram chukor</i>).
<i>Threskiornis melanocephalus</i>	White Ibis.
<i>Trachypithecus pileatus</i>	Capped langur.
<i>Tragopan species</i>	Horned Pheasant.
<i>Turnix tanki</i>	Indian or Yellow-legged Button Quail.
‘ U ’	
<i>Ursus arctos</i>	Brown Bear.
‘ V ’	
<i>Viverra zibetha</i>	Large Indian Civet.
<i>Viverricula indica</i>	Small Indian Civet.
<i>Vulpes bengalensis</i>	Indian Fox.

APPENDIX VI

Some interesting particulars of the common wild animals of India

Sl. No.	Name of animal	Weight	Gestation period	Life span	Record size
1	2	3	4	5	6
1	Tiger	Male upto 230 kg (500 lb.)	3½ months (106 days), usually 2-3 but upto 6 cubs in a litter.	About 20 years.	Length 3.76 m. (12' 4") over curves, 3.23 m. (10' 7") between pegs.
2	Lion	A little less than the tiger.	3¼ months (108 to 116 days). Usually 2 but upto 5 cubs in a litter.	Do.	Length 2.9 m. (9' 4").
3	Panther (Or Leopard)	Male upto 70 kg (150 lb.) Female about 50 kg (110 lb.)	3 months (92 days) 2 to 4 cubs in a litter.	..	Length 2.8 m. (9' 4").
4	Mongoose	About 1.4 kg (3 lb.)	2 months.	7 to 8 years.	..
5	Hyaena	About 43 kg (95 lb.)	7 months ; 2 to 4 cubs in a litter.	Average 16 yrs. (maximum 24 yrs.)	..
6	Wild Dog	Upto about 18 kg (40 lb.) mean 17.2 kg (38 lb.)	2½ months. Usually 4 to 6 cubs in a litter.	..	1.30 m. (51") including the long brush at the end of the tail.
7	Wolf	18 to 27 kg (40 to 60 lb.)	9 weeks (60-63 days) 3 to 9 whelps in a litter.	12 to 15 years.	..
8	Jackal	7.7 to 11.4 kg (17 to 25 lb.)	Do.	12 years.	..
9	Fox	1.8 to 3.2 kg (4 to 7 lb.)	7½ weeks.	..	..
10	Bear	Upto 180 kg (400 lb.)	7 to 8 months. Usually 2 to 3 cubs at a time.	40 to 50 years.	Black bear 2.18 m. (7' 2"). Sloth bear 2.16 m. (7' 2"). Brown bear 2.34 m. (7' 8").
11	Elephant	3000 to 3600 kg (7000 to 8000 lb.)	About 20 months. Usually 1 calf at a time, rarely 2 or 3.	Upto 100 years or even more.	Height at shoulder 3.35 m. (11') Length of tusk 2.8 m. (9' 2") Weight of tusks 73.0 & 72.6 kg (161 and 160 lb.)
12	Wild Ass	About 180 kg (400 lb.)	11 months (one foal at a time).	..	..
13	One-Horned Rhinoceros	1350 to 1800 kg (3000 to 4000 lb.)	17 to 18 months (a single young one at a time).	Upto 100 years.	Height at shoulder 1.93 m. (6' 4"). Length of horn 62 cm. (24½").
14	Bison (<i>Gaur</i>)	About 900 kg (2000 lb.)	Not accurately known.	..	Horns Sweep 218 cm. (86"). Spread 135 cm. (53"). Girth 55 cm. (21½").

15	Wild Buffalo	About 900 kg (2000 lb.)	10 months (1 to 2 young ones at a time).	..	Horns Length 197 cm. (77½"). Swcep 424 cm. (167"). Spread 245 cm. (96½"). Span 243 cm. (95½"). Girth 58 cm. (23").
16	Urial	Do.	Between 4 to 7 months. 1 to 2 young ones at a time.	..	Length of horn 100 cm. (39½").
17	Bharal (Blue Sheep)	55 to 68 kg (120 to 150 lb.)	Not accurately known, probably a little over 5 months. (160 days).	..	Length of horn 82 cm. (32½").
18	Ibex	About 90 kg (200 lb.)	..	..	Length of horn 147 cm. (58").
19	Serow	About 90 kg (200 lb.)	About 7 months. Usually 1 kid at a time, sometimes 2.	..	Length of horn 32.2 cm. (12½").
20	Goral	23 to 27 kg (50 to 60 lb.)	6 months. Usually 1 kid at a time.	..	Length of horn 24.7 cm. (9¾").
21	Chinkara (Indian Gazelle)	About 23 kg (50 lb.)	Not recorded.	..	Length of horn 38.7 cm. (15¼").
22	Black Buck (Indian Antelope)	About 40 kg (90 lb.)	Not recorded. One or two fawns at a time.	..	Length of horn 81 cm. (31¾").
23	Four-horned Antelope (Chou-singha).	18 to 20 kg (40 to 45 lb.)	About 6 months.	..	Length of horn 12.0 cm. (4¾").
24	Blue bull (Nilgai)	320 to 360 kg (700 to 800 lb.)	Between 8 and 9 months.	..	Horn length 29.8 cm. (11¾"). Girth 24 cm. (9").
25	Kashmir Stag	About 180 kg (400 lb.).	About 6 months.	..	Antlers Length 129 cm. (50½"). Span 89 cm. (35"). Girth 20.3 cm. (8").
26	Brow-antlered Deer (Thamin)	90 to 110 kg (200 to 250 lb.)	8 months, one fawn at a time.	..	Length of horn 107 cm. (42"). Girth 16.5 cm. (6½").
27	Swamp Deer (Gond)	180 to 230 kg (400 to 500 lb.)	About 6 months.	..	Antlers Length 104 cm. (41"). Girth 17.1 cm. (6¾").
28	Sambhar	Upto 320 kg (700 lb.)	8 months. One fawn at a time.	..	Antlers Length 128 cm. (50½"). Span 61 cm. (24"). Girth 20.9 cm. (8½").
29	Hog Deer (Para)	About 45 kg (100 lb.)	8 months.	..	Length of horn 61 cm. (24").
30	Spotted Deer (Cheetal)	Upto 90 kg (200 lb.)	Between 6 and 8 months. About 15½ years.	..	Antlers Length 105 cm. (41½"). Span 63.5 cm. (25").
31	Barking deer (Muntjac)	18 to 23 kg (40 to 50 lb.)	6 months.	..	Length of horn 26.3 cm. (10¼"). Span 10 cm. (4").
32	Musk Deer	9 to 14 kg (20 to 30 lb.)	A little over 5 months (160 days). Usually 1 fawn at a time, sometimes 2).	..	Length of tusk 10 cm. (4").

APPENDIX VI—contd.

1	2	3	4	5	6
33	Mouse Deer (Chevrotain)	2.3 to 2.7 kg (5 to 6 lb.)	About 160 days. 2 fawn at a time.	..	..
34	Wild Boar	Upto 230 kg (500 lb.) or even more.	4 months, 4 to 6 young ones in a litter.	..	Length of tusk 37.4 cm. (14½").
35	Panda	4.3 kg (9½ lb.)	90 days, 2 young ones are born in a litter.	..	..
36	Himalayan Thar	90 kg (200 lb.)	..	..	Horn length 42.5 cm. (16½") with a girth of 26.7 cm. (10½").
37	Slow Doris	..	One young at a time.	..	..
38	Musk Shrew	..	Several at a time.	..	..
39	Markhor	..	1 or 2 youngs at a time.	..	..
40	Hangul	204 kg (450 lb.)	6 months.	..	Length of horn along outside curve 128 cm. (50½"), girth 23 cm. (9").
41	Indian Pangolin	11.3 kg (25 lb.)	1 to 2 young ones at a time.	..	Length of horn 61.5 cm. (24½"). Girth 31 cm. (12½").
42	Takin	..	..	..	..

(NOTE :—For scientific names of the animals, see Appendix " IV ")