

BIRDS OF ARID AND SEMI-ARID TRACTS



A. K. MUKHERJEE

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Birds of Arid and Semi-Arid Tracts

AJIT KUMAR MUKHERJEE
ZOOLOGICAL SURVEY OF INDIA, CALCUTTA



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AUTHOR'S PREFACE :

The avifauna of the northwestern India during the past in hundred years or so, reported by Ferdinand Stoliczka, A.O.Hume, C. D Lester, High Wishtler and others, though quite informative and useful, yet are scattered. Such literature hardly serves the purpose as a guide for bird study of that area. Mention may however be made of two contributions of significance. viz., Salim Ali's 'The Birds of Kutch' brought out in 1945 and the other of Dharmakumarasinghi's 'Birds of Saurashtra' that appeared in 1954. These works are no doubt classic but are restricted to particular regions only. The present author has therefore designed this publication as an introduction to the avifauna of the arid and semi-arid tracts of northwest India spread over Punjab, Haryana, Rajasthan and Gujarat.

The author has great appreciation for the enthusiasm of Dr. M. L. Roonwal, Director (Retired) of Zoological Survey of India, for launching a project of general faunistic survey of the Great Indian Desert which got started in 1956 and continued for two decades, intensively in some areas, viz., Sambhar Lake (Central Rajasthan), Jodhpur district (West Rajasthan) and the dry deciduous forest of Gir (South Central Gujarat), and extensively in the arid and semi-arid tracts. The author who was one of the members of the faunistic exploration parties, being an ornithologist, had special interest, brought invaluable collections of birds from inhospitable desert areas of Rajasthan and Gujarat. These collections form the basis of the present book. Enactment of the Wild Life (Protection) Act of 1972 of the Government of India together with restrictions imposed by the forest departments of different states affected collections of bird samples and bird study was limited to field observations only for the last one decade.

The physiography of the Great Indian Desert is fast changing as a result of habitat destruction, construction of canals, setting up of new water reservoirs, dams and dykes, and also experimental afforestation and crop raising. The cumulative effect of such changes is likely to affect the fauna and flora in general and avifauna in particular. What is found and described today in this book may require additions or deletions in future.



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INTRODUCTION

A consolidated account on birds of the arid and semi-arid areas of northwestern India have been in some demand among naturalists for the past few decades. Birds of such arid areas are not restricted only to the boundries of India but are also spread over, on the basis of physiographic conditions, to countries of Southwest Asia as well. Portions of the two states of northwest India, viz., Rajasthan and Gujarat are drought affected arid areas where desert is well established and the tentacles of aridity have penetrated into contiguous areas of Punjab and Haryana as also of Western Madhya Pradesh. An account of birds inhabiting such arid and semi-arid tracts as found in the aforesaid states, has been prepared to meet the need of the day. This not only enlists birds specially adapted to live under desert conditions but also includes such which have greater flexibility of adaptation to move with seasonally changing physiographic conditions.

Reports on bird fauna and various aspects of the biology of birds appearing in the late 19th and the present century from the erstwhile princely states of northwestern India are no doubt of much value but are scattered through the literature. Such informations may be summerised here.

Stoliczka (1872) gave a first-hand account of birds and mammals of Kutch. Adam (1873, 1874) listed the birds of the Sambhar Lake (central Rajasthan) and its vicinity. On the collection of birds made by Dr. King from Mount Abu and Jodhpur during 1870-1872, Butler (1875-1876) published an interesting account of the birds of Mount Abu and northern Gujarat, which included 761 species, and in the editorial comments on Butler's paper, Hume contributed a series of notes as additional information on birds occurring in western and southern Rajasthan. Hume (1878) also made large collection from Jodhpur in the winter months and published an interesting account of the birds of the drought areas. Palin (1878)* gave a vivid account of the 'Birds of Kutch' Moreover interesting observations were made by some field ornithologists. Barnes (1886, 1888-1890) studied nesting of birds in Rajasthan and other parts of western India. Newnham (1900) reported on some uncommon birds of Rajasthan. Lester (1903)* revised Palin's 'Birds of Kutch' with information of additional 44 species. The Late Maharao Sri Khengarji of Kutch, the discoverer of the only known breeding grounds of the Flamingo in the Rann of Kutch, initiated studies on its breeding behaviour in the early part of the present century. Stray avifaunal studies were made from some arid areas of the Province of Punjab of the British India, accounts of which are from Hissar (Haryana State, India) given by Whistler (1915). Studies on bird groups, such as 'Birds of Prey' were made by Donald (1917, 1919-1921). Foster (1923) and Whistler (1923) studied the Corvidae of the Punjab independently. Whistler (1924-1925) gave interesting notes on the weavers and finches of the Punjab. Further additions to the avifauna were made by Waite (1937). V.S. La Personne, an enthusiastic bird collector of the Bombay Natural History Society made a collection of 361 birds from the erstwhile Jodhpur State in 1933-34, which were systematically worked out by Whistler (1938). He listed 356 species and subspecies based on La Personne's collection but also on basis of earlier collectors and informations contributed by Hume, Dr. King and several others. Ali (1941) reported on the birds of Bahawalpur (West Punjab, Pakistan). Ali (1945) published an excellent account of the 'Birds of Kutch' which deal with some 360 species and subspecies, mostly based on his own collection and collections and observations made by Sir Geoffrey Archer, Maharao Sri Khengari, Capt. A.T.H. Newnham and Col. O' Brien during the first four decades of the present century and earlier reports of Stoliczka, Hume, and Lester of the last three decades of the 19th century. Biswas (1947) reported on the collection of birds from Rajasthan present in the Zoological

* cited from Ali, S. 1945. Birds of Kutch.

Survey of India collections. Madansinhji (1949) furnished some interesting notes on the birds of Kutch. Dharmakumarsinhji's (1954) classic book on the 'Birds of Saurashtra' contains information on 553 regional birds of which some 300 belong to the arid and semi-arid areas of Gujarat. In recent years, additional notes on birds and records of several species and subspecies not known in Saurashtra were further contributed by Dharmakumarsinhji (1954, 1956, 1958, 1961, 1963, 1965, 1968) Vaurie and Dharmakumarsinhji (1954) added a Sandlark new to science from Saurashtra. Ali (1954 and 1955) reported on the 'Birds of Gujarat' covering the contiguous areas of the arid and semi-arid tracts. Avifaunal records of significance are of Shivraj Kumar (1954m 1955, 1961, 1962, 1959, 1971). During the last three decades, regular bird studies in Kutch were made by Lavkumar (1958), Ali (1959, 1960), Himmatsinhji (1950, 1963, 1964, 1968, 1969, 1970), and Shekar (1960) also further added to the knowledge of the avifauna of Kutch. Ecological studies, breeding behaviour, food and feeding-habits, population and interesting reports on some birds have been provided by Ali (1960, 1975), Sen and Sankhla (1962), Mukherjee (1963), Prakash and Ghosh (1963, 1964), Christensen (1963), Christensen, Bohl and Bump (1964), Sharma, S.C. (1965), Sharma, I.K. (1965, 1969), Mathur (1969), Prakash (1974), Vardhan (1980). Roonwal (1982) in his valuable contribution 'Fauna of the Great Indian Desert' gave a concise review of the avifauna with notes on some important birds occurring in the arid zone on the basis of reports by Zoological Survey of India Rajasthan Desert Survey parties.

Although the northwestern part of the Indian subregion has been politically divided into two countries in 1947, the avifauna has remained the same. Mention may be made about Sind (Pakistan) which is very similar to the Little and Great Rann of Kutch and northwest parts of Gujarat. Naturalists took great interest in Sind Province and contributed several reports on the avifauna are of Hume (1872), Butler (1877, 1878, 1879), both the authors brought a series of publications in the form of notes and additions to the Sind avifauna. Ticehurst (1922-1924) also added interesting reports and Holmes and Wright (1966, 1969) gave an excellent review of the birds of Sind.

The present contribution is largely based on the extant literature together with ornithological surveys conducted by the author and his colleague ornithologists in western and central parts of Rajasthan during the periods 1956-1964, and of Gir, Girnar and Kathiawar in 1958-1959 and 1962, and the author's observations made during the last two decades in the arid tracts of Rajasthan and Gujarat.

In the description of the species and subspecies (Chapter VI) under the head 'Recognition' the first para gives the recognition of the bird in field based on observable characters through binoculars and the following para gives details of characters observed when the bird is in hand.

To give a fair idea of the size of the birds, these have been compared with common familiar birds like the House Sparrow, Munia, Crow, Myna, Bulbul, Dove, Pigeon, Kite, Vulture, Village Hen and Cock, Domestic Duck and Goose. The total length given for each species subspecies is approximate, expressed in c.... millimeter (mm).

Calls mentioned of different species of birds, as heard in field, have been checked from the available published records. Difference of notations, if any, have otherwise been mentioned.

For nomenclature and systematic sequence of birds as given in Chapters VI and VII, Ripley's 'A synopsis of the birds of India and Pakistan' (1982, Second Edition) has been followed.

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I am indebted to the Director, Zoological Survey of India for providing me an opportunity to complete the project on which this book is based. This project was already in hand when I was superannuated, and only after my appointment as Emeritus Scientist, it could be completed. I desire to express my appreciation and thanks to the secretary, Ministry of Environment and Forests, Government of India, for favour of funding the project.

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I am fortunate to have been able to secure ungrudging cooperation of my wife, Sm. Dipa Mukherjee, who not only furnished me with her field observations on birds whenever she accompanied me but also has helped me in preparing the index of the book. I appreciate her patience in bearing with me in the most difficult times, passing hours in silence and in loneliness at home, when I kept busy doing my home work on this project.

ARID AND SEMI-ARID TRACTS

Arid and semi-arid tracts are dry, parched, sandy, rocky and baked barren land. Such tracts are characterized by extreme high and low temperatures, inadequate annual precipitation and higher rate of evaporation than retention of moisture in soils. Such an arid wasteland that apparently looks lifeless is a desert, but which may harbour a large number of different life forms adapted to withstand the rigours of climates.

Today almost one-fifth of the surface of the earth is covered by arid waste and this is on further increase. As per report of the United Nation's Environmental Programme of 1977,

about 36.3 per cent of the earth's surface has been categorised as desert. This includes absolute arid, arid and semi-arid areas. Based on soil and vegetation data, 43 per cent of earth's surface falls within the arid and semi-arid categories. Most of the world's desert regions are expanding at an alarming rate, about one per cent of the total surface of the earth per year, such as by destruction of vegetation of the soil by overgrazing of cattle, sheep and goat, felling of trees for firewood and timber which exceed the rate of natural regeneration.

The desert is broadly recognized under two heads, viz., the hot desert and the cold desert. Hot desert such as the Sahara and the Kalahari have no cold season. In the cold desert like the Gobi, Pamir, Great Basin, the temperature during the winter drops below the freezing point (Minus 6°C.). On climatic basis five types of deserts are recognizable (Cloudsley-Thomson 1979). These types are as follows:

Subtropical deserts, cool coastal deserts, rain-shadow deserts, interior continental deserts and polar deserts.

In the Old World the largest desert is the Great Palaeartic Desert that stretches over the two continents, - Africa and Asia. This desert envelops the major part of North Africa that extends through West Asia (Israel, Arabia, Iran, Baluchistan) to northwest India.

The Great Desert of the Indian subcontinent shared by India and Pakistan, is also known as the Thar, which in the Indian Region has recently been named as the *Marusthali*. This part of the desert is in fact, the eastern extremity of the Palaeartic Desert. The Thar covers an area of 60,000 km² and lies between latitudes 21°25' and 30°30'N and longitudes 67°25' and 75°25'E.

The *Marusthali* is truly represented in the western part of Rajasthan and northwest Gujarat. Contiguous areas which are semi-arid, as found in the southern parts of Punjab, southeastern parts of Haryana, northwestern parts of Kathiawar Peninsula, and the Rann of Kutch are, herein, included under the *Marusthali*.

Semi-arid and some arid patches are also found in Deccan (Peninsular India) which includes Maharashtra, Madhya Pradesh, Andhra Pradesh and Tamil Nadu. The present contribution, however, has been limited to *Marusthali* only.

GEOLOGICAL HISTORY OF THE GREAT INDIAN DESERT

Krishnan (1952) stated: "There is little doubt that western Rajputana (Jaisalmer and Bikaner) was occupied largely by a sea during the Jurassic, Cretaceous and Eocene. It is not clear when this area was uplifted into dry land but it has been sometimes in the Upper Tertiary. Even then some large lakes and lagoons might have been left over, which gradually dried up." From the Pleistocene to the Recent times, there has been considerable changes in the course of rivers in northwestern India. There are old river courses in western Rajasthan, the more important of which are the Saraswati, Ghaggar, Luni, etc. Oldham (1886) gave his hypothesis on probable changes in the geography of Punjab. In mid-Miocene, the original course of the Jamuna was through northwest India and it was a part of the Indus river system which finally poured in the Arabian Sea. From the drainage basin of the upper Jamuna river several off-shoots took course towards the southwest almost in line with the Indus system. Tectonic changes in the sub-Recent times which involved tilting and uplift of the Sutlej-Jamuna divide made the course of the Jamuna to change southeastwards. A twin river and the river Saraswati were born

between the Sutlej and Jamuna Divide which drained southwards and confluenced in northwest Rajasthan and flowed as Ghaggar to join the river Indus near Bahawalpur (Pakistan). In Recent times, the Ghaggar dried up but its dry bed is still traceable (Oldham, 1883). It is in all probability the uplifting of the Aravalli trace ridges in Delhi and contiguous southern chain of hills up to northern parts of Gujrat, and the gradual silting of the Tethys Sea of the Eocene sea-floor that were responsible for the creation of the Thar Desert (Krishnan 1952). The Thar which lacked irrigation due to diversion and drying of river courses and gradual elevation of the area during the last Himalayan movement, had a profound effect on the physiography and climatology, resulting in the loss of the vegetation cover. Sewell (1951) propounded a hypothesis that due to increased melting of snows during the postglaciation period, the sea level is on the rise by one centimeter every 100 years, causing long range fluctuations of climates. During one million years of the Pleistocene, there have been four major Glacial Periods intervened by three Arid Periods. The last Glacial Period ended about 7000 to 10,000 years ago when the temperatures were lower, rainfall was higher and evaporation was minimum. Under such favourable climatic conditions extensive forests and marshes stretched in the areas where the desert is now well established.

The Aravallis, one of the oldest rocky mountain are the banded gneissic complex, the isochron age of which is about 2550 million years, extend as already stated above, from Delhi through Haryana, Rajasthan to Gujarat, projecting as small hillocks, ridges and hills rising to c 1070 m in discontinuous chains. Such hills of the old rocks protruding through aeolian veneer indicate that the hills in the Thar is a part of the Peninsular mass (Krishnan 1952).

The western part of Gujarat that lies between the Rann of Kutch and the Gulf of Cambay is dry, desiccated and saline. This part of Gujarat was also a part of the sea which in course of tectonic changes was elevated. The vast expanse of tidal flats, contiguous sand-blown plains interrupted by flat-topped and steep-edged plateau, present an overall picture of the arid terrain that merges in the north with the Thar desert and thereby is considered to be an arm of the desert extending to the coastal belt.

It is believed that the Great Indian Desert is extending eastwards in a great convex arc engulfing fertile areas of Punjab, Haryana, Uttar Pradesh and Madhya Pradesh. Krishnan (1952) stated that the desert conditions must have set in well after man appeared, possibly in geological sub-Recent times. One thing is certain that the concerned area has been harnessed beyond its carrying capacity.

PHYSIOGRAPHY OF THE AREA

(a) *Topography*

The present topography of the Indian Desert is the sequence of the past geological history. It is well established that the present desert area of North and West India was well drained by rivers during the late Pleistocene Period. Tilting of north-western parts of India, upset the flow of such rivers resulting into the disappearance of some of the rivers and diversion of drainage of some from north-west to southeast. As a result the Jamuna took a southeastern course to join

the Ganga in the east. The *climatic optimum* attended during glaciations when plant growth was most favourable was followed by a warm, dry climate known as the xerothermic period during the last 10,000 years. Drought-tolerant plants appeared and grassland invaded the drier areas. Gradually desert conditions prevailed due to loss of drainage system, soil erosion, sandy soil with very little soil moisture and lack of precipitation required to maintain biotic equilibrium. Today, as we find, the Marusthali presents arid topographic features broadly divisible as follows:

- (i) Shifting sand-dunes
- (ii) Permanent sand-dunes
- (iii) Interdunal valleys
- (iv) Rocky, sandy broken waste
- (v) Saline and alkaline flats

The above mentioned physiographical divisions have been dealt with later in the chapters on biota (V c.p.).

(b) *Climate-factors regulating the ecosystem*

1. Heat: The hot desert of *Marusthali* attains the maximum temperature in May-June, which shoots up to 48°C., (50°C recorded in Devikot, Jaisalmer district, W. Rajasthan, May 1959-A.K.M.*). During the winter months the day temperature is about 40°C. Nights are cooler, temperature drops quite fast sometimes down to -4.4°C Prakash 1974) in winter. Biswas, B. reported 2°C in Bikaner in January 1957 (personal comm.)

2. Rainfall: Rainfall is received in *Marusthali* by the southwest monsoon in July-September. It is less than 25.5 cm; annual rainfall variations are from 8.80 cm to 42.50 cm (Pramanick and Hariharan 1952), the average being 30 cm in the southeastern and 13 cm in the northwestern parts. In some areas rainfall may be fairly good and regular, whereas in other parts, it may be fair but irregular; at times there may be no rains at all throughout the year. water retention in soil is dependent on the precipitation; with scanty rainfall soil moisture is negligible. Water is obtained by animals from surface water wherever it exists, from succulent plants, insects and other animals or from dew, the latter being the greatest source for supplying moisture to arthropods and other animalcule. relative humidity is quite low, the average humidity varies from 85 per cent in July to 25 per cent in April and also between day and night. Biswas, B. recorded less than 20 per cent in Jan-Feb. at Sardarshahr, Churu District (personal comm.). Frosts are generally severe during winter, tree saplings up to two metres height sometimes succumb to such frosts.

3. Wind: The *Marusthali* that lies in the trade-wind belt of the Northern Hemisphere is dry, anticyclonic in origin. This implies gradual descent of air which gets warmed up at an adiabatic rate of 10°C, per 1000 metre and this air descends at a fast pace to lower level and at soil surface level it remains very hot and contains practically no moisture. Strong winds and sandstorms together with vortices of dust are frequent, particularly in spring and summer. The overhead air blows violently during the day time, moving sometimes at 80 km/hr and may attain a velocity of 130 km/hr. In coastal deserts there remains sufficient moisture and are therefore, comparatively cooler and have less vortices.

4. Light: Blinding brightness due to glaring white light of the sun, high light intensity, dry

* A.K.M. = A.K.Mukherjee (the author).

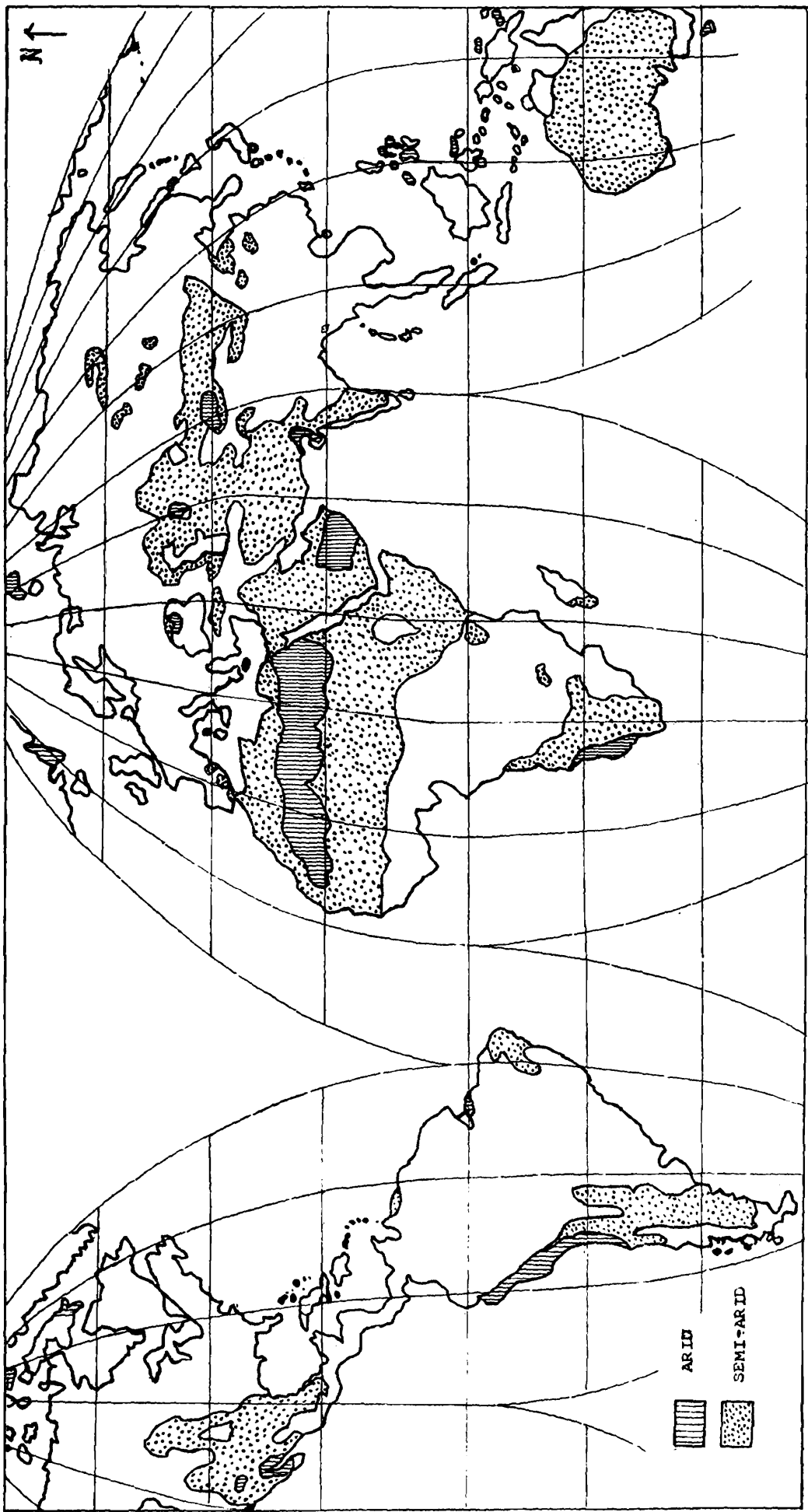


Fig. 1. Map of World showing Arid and Semi-Arid Zones.

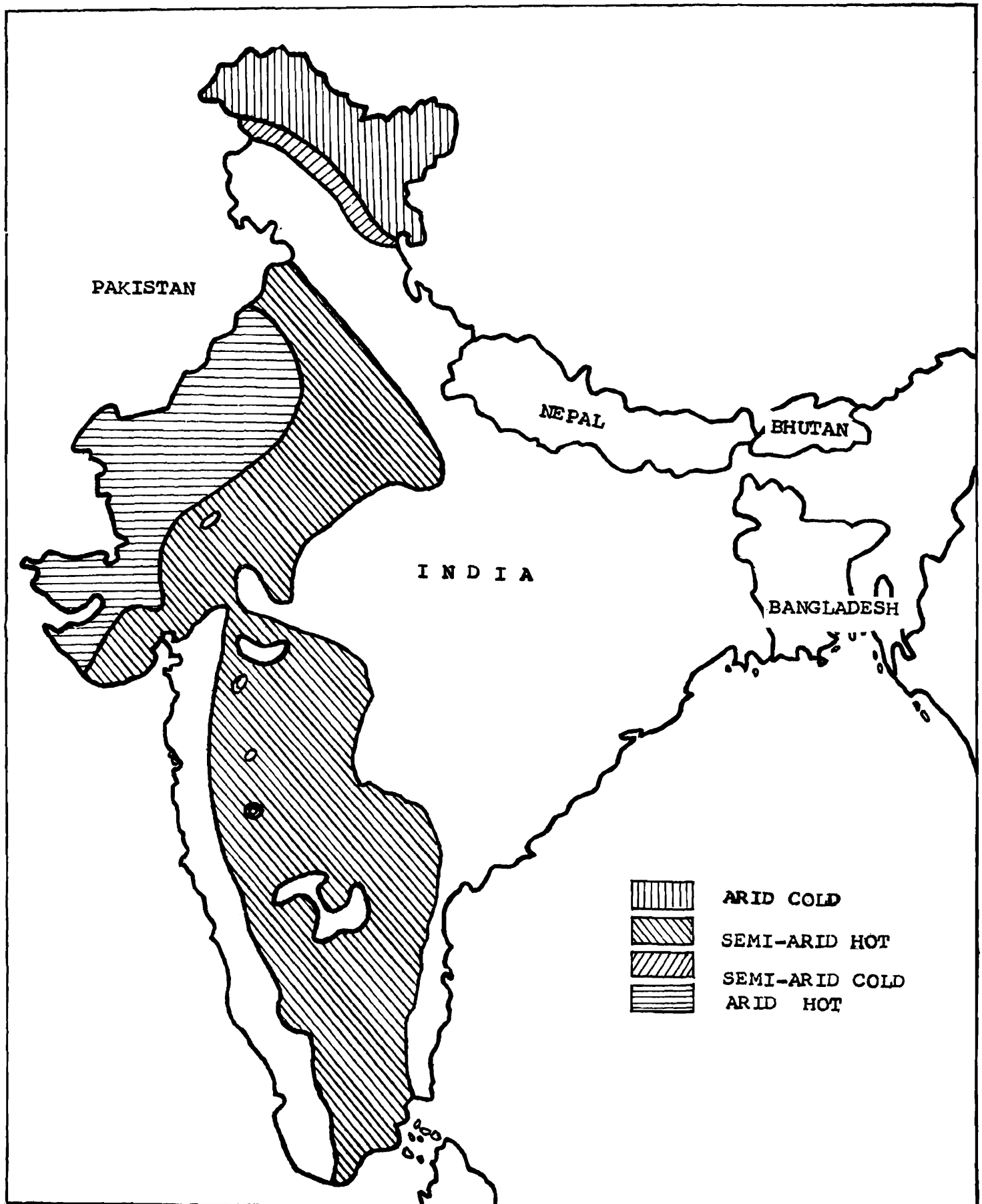


Fig. 2. Arid and Semi-Arid Zones in India.

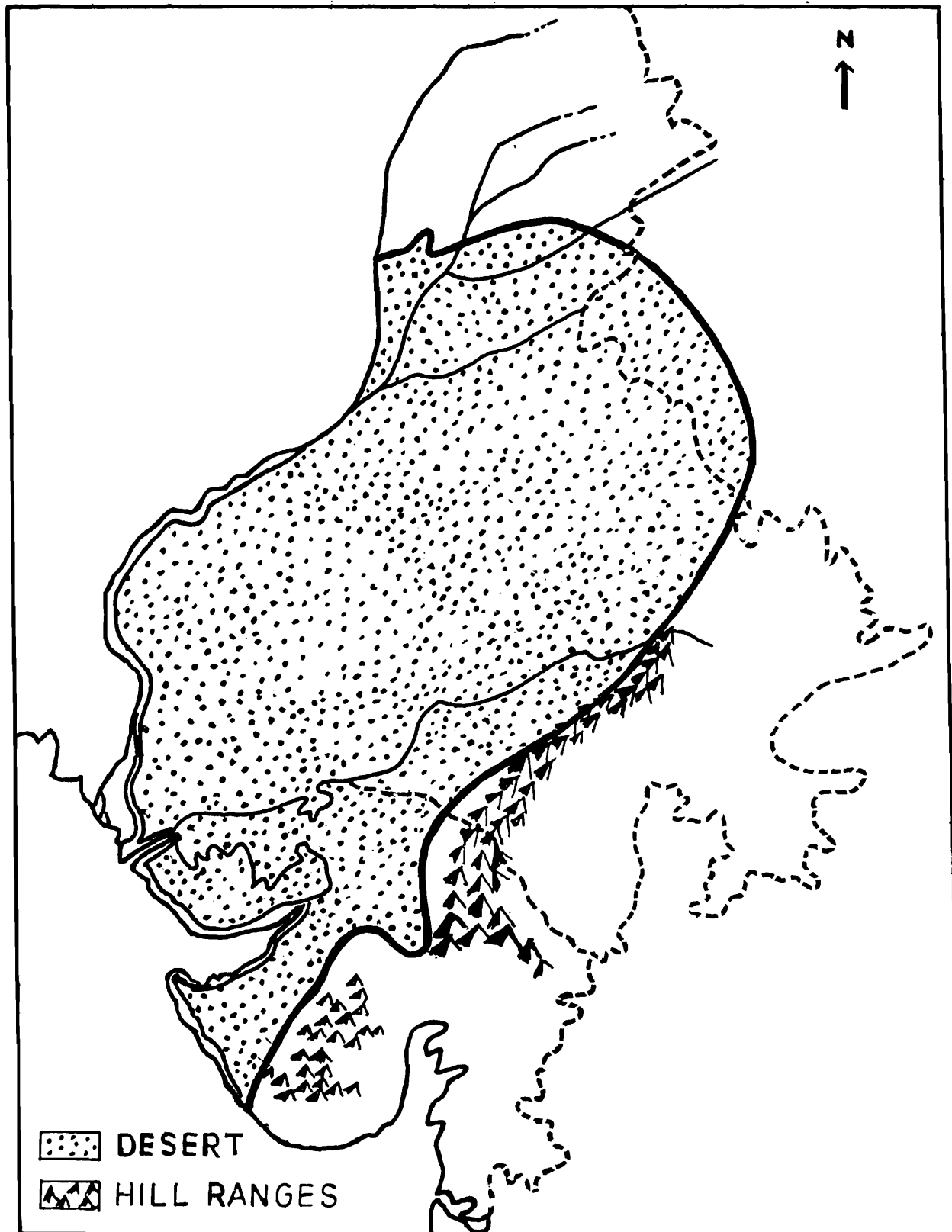


Fig. 3. Map showing the Great Indian Desert (Thar) extending over the Indian subcontinent.

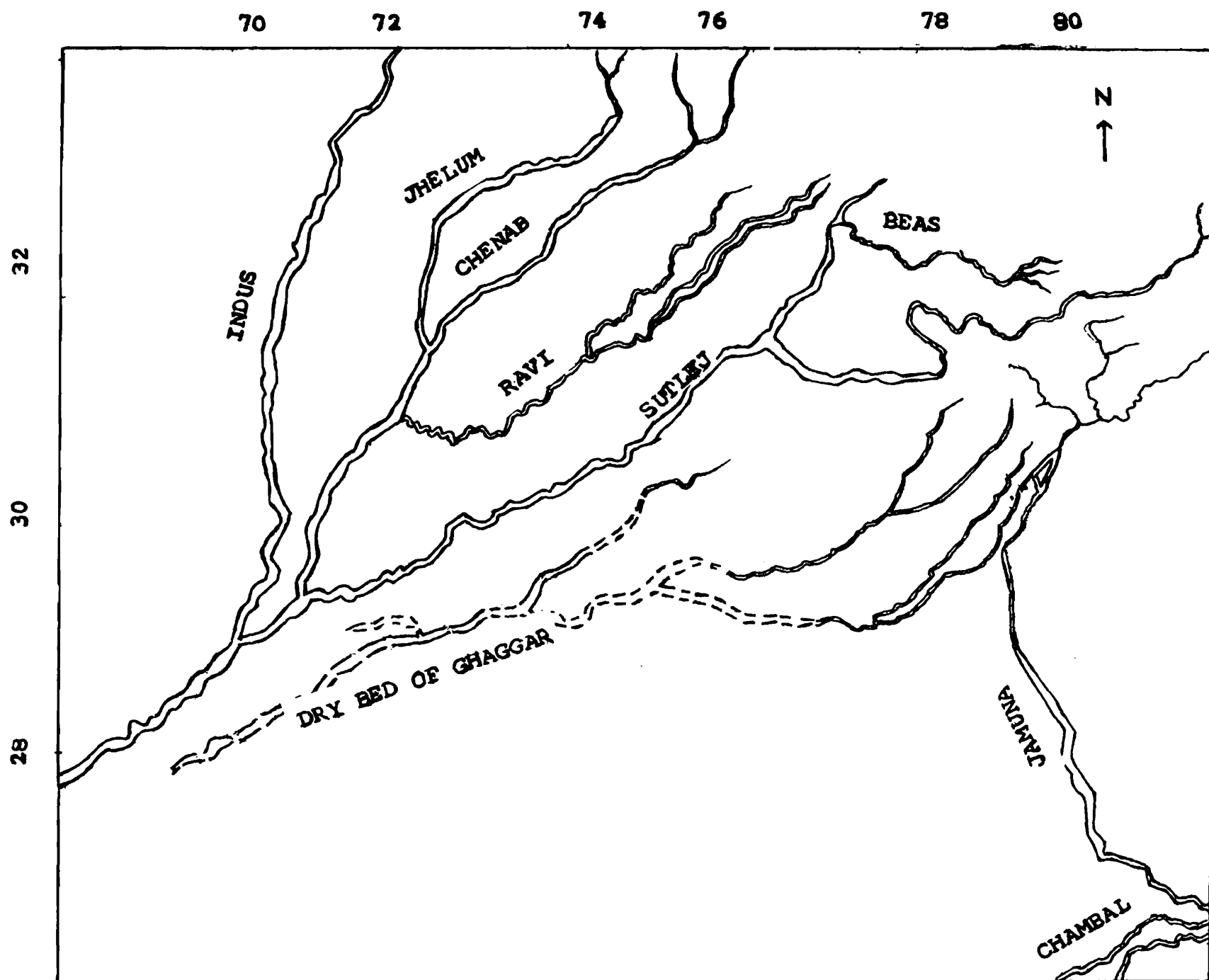


Fig. 4. Map showing the existing river courses and the dry courses in North East India.

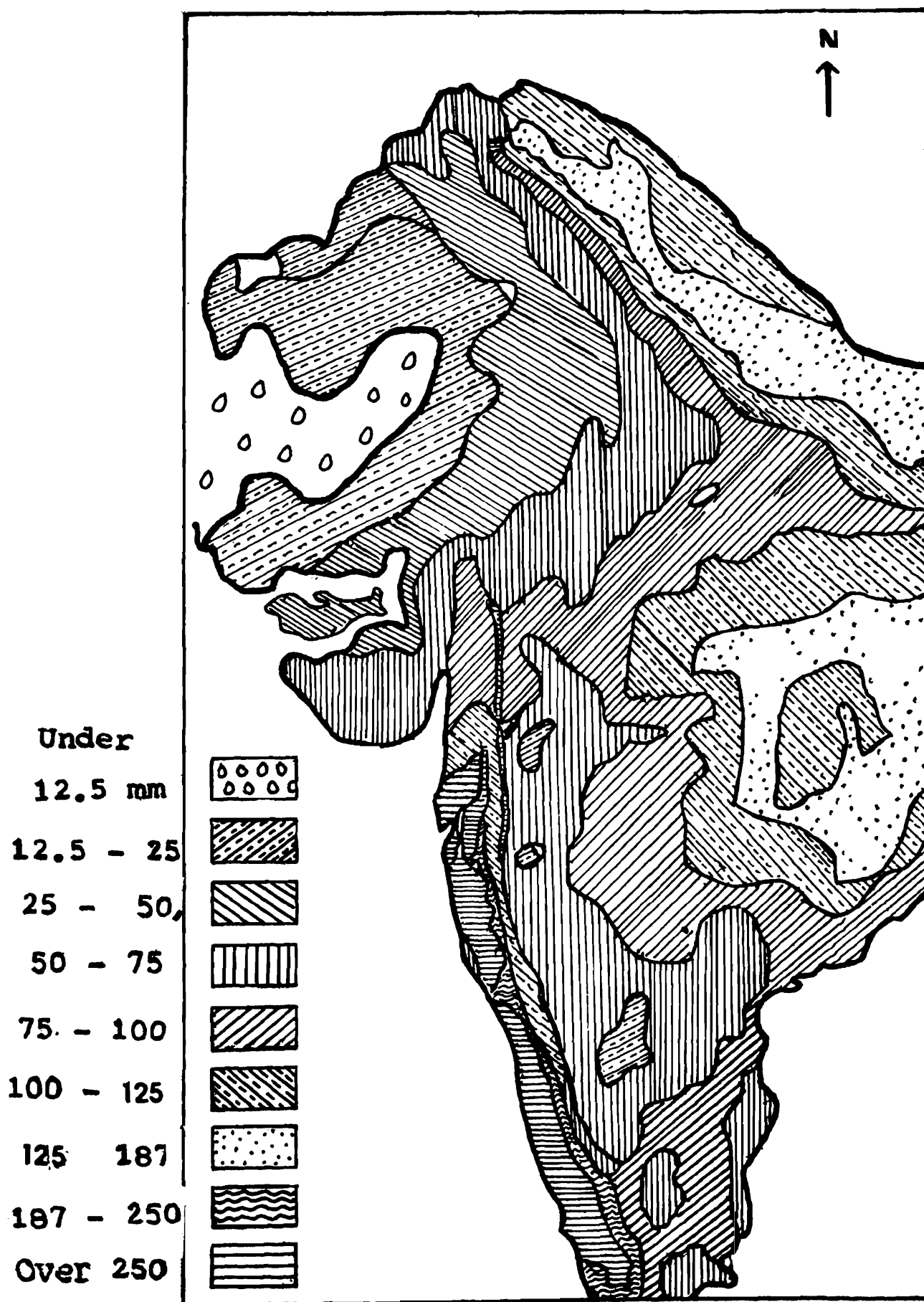


Fig. 5. Map of North, West and South India showing the rainfall distribution covering the Arid and Semi-Arid Tracts.

air, cloudless sky, all such factors help ultra-violet radiation to the maximum, affecting living organisms in the desert. Nights in deserts, when moon is full, floods the landscape with brilliance and all landmarks are clearly visible at a long distance. Even on dark nights, starlights are good enough to locate objects and paths through deserts since the sand full of quartz reflect the light, scattering more light. At nights desert-living animals become more active; both predator and its prey have excellent night vision.

5. Microclimate: Microclimate exists in burrows, bushes, underside of leaves, grass-roots, holes in trees, cracks in soils and under stones. such places are helpful to animals and plants to take refuge to survive. Special conditions prevail in such micro-habitats. A relatively moderate and constant temperature, adequate moisture, exposure from direct sun, avoidance and escape from being blown by air sweep, keep the organisms in safe port. Normal requirements of fossorial animals are available at a depth of 100-200 cm as far as cooler condition and moisture requirements are concerned. Such shelters are utilized by animals during the day when they remain inactive and wait to resume their activities with the nightfall. The burrows are cooler than the soil surface by 19.2°C to 20.9°C , except during monsoon when the difference is 11.4°C (Prakash *et al.* 1965).

6. Soils: in general the soil in desert is sandy-loam. In some areas accumulation of lime concentration within 150 cm of soil profile is found. Saline sodic soil is a common feature. The soil of the coastal belt of Kutch, Sambhar and Didwana salt lakes are characterized by the occurrence of a high proportion of soluble salts, usually chlorides and sulphates of alkali bases. The soil affected by alkali have a higher pH which may range between 9.0 and 10.5 and exchangeable sodium may be over 15 per cent (Dalvi and Ghosh 1980). Schokalskaya (1932) considers the soil in large part of the Indo-Gangetic plains to be steppe-like *serozem-type*. Such sandy *serozem* is found in central Thar desert, also in the western flanking plains of the Aravallis extending to the northern parts of Gujarat. In Kutch however, saline *serozems* are present.

Desert soils are more or less purely mineral type but wherever high accumulation of salts is there, the physical conditions of soils are affected considerable due to depression of the clay colloids. As a result it becomes a limiting factor for vegetative growth. Soil being very coarse in texture, loosely bound, low in water-holding capacity, and low base exchange property, poor moisture retentivity and low bacterial activities, render the soil unproductive.

(c) Biota

1. Flora (vegetation of the area)

In general the vegetation of the desert is largely composed of shrubs and herbs dominated by grass and only a few species of trees. These are mostly xerophytic plants, having deep and wide root-system. Some plants remain dormant in the subsoil as tubers, bulbs or corms, to tide over hazardous climate and sprout as soon as favourable conditions prevail, may be for a very short time. Xerophytic plants bear small thick leaves, thorns, sometimes completely leafless but have swollen trunk and thick sap.

(i) Shifting sand-dunes are unstable, subject to effects of winds of high velocity, which help to shape the dunes in geometrical designs but such structures are temporary. such dunes hardly bear any vegetation save in monsoon when some of them get stablished and scanty well spaced

vegetation crop up. Such species commonly met with are:

<i>Aristida adscensionis</i>	Grass
<i>Indigofera cordifolia</i>	Grass
<i>Cyperus rotundus</i>	Grass
<i>Citrullus colocynthis</i>	Creeper (sprouts during rains and dries up in October)

(ii) Fixed dunes which are of permanent nature are capable of supporting some stable vegetation throughout the year by retaining moisture at short depths below the surface. Rainwater that enters the dunes accumulate in the under surface which serves as storage for establishing vegetation. Such plants have wide root-ramification for tapping available underground water. Besides the species as already mentioned under (i), the sandy biotope of the fixed dunes support the following plants:

Scientific names	Local names	Type of plant
<i>Zizyphus mauritiana</i>	Ber	Tree
<i>Zizyphus nummularia</i>	Ber	Tree
<i>Prosopis cineraria</i>	Khejari	Tree
<i>Balanites roxburghii</i>	Hingota	Tree
<i>Calligonum polygonoides</i>	Phog	Shrub
<i>Capparis decidua</i>	Karil	Shrub
<i>Euphorbia spp.</i>	Thuhar	Shrub
<i>Crotalaria burhia</i>	Sinia	Shrub
<i>Leptadenia spartium</i>	Khinp	Shrub
<i>Calotropis procera</i>	Aak, Aakra	Shrub
<i>Aerya pseudotomentosa</i>	Sinia, Bui	Herb
<i>Elusine compressa</i>		Herb (Grass)
<i>Lasiurus indicus</i>		Herb (Grass)
<i>Panicum sp.</i>		Herb (Grass)

(iii) The interdunal valleys are shrub-steppe lands which are utilized for raising crop. The soil though sandy are more or less stabilized. With moderate amount of rain, even if it sprinkles for a few days, grass sprouts up bringing forth greenness to the valleys. Such terrain support trees, shrubs and grasses that are found in sandy soils as already mentioned under (ii). Besides the natural regeneration of vegetation the valleys are cultivated, yielding cereals, pulses, oil-seeds and vegetables.

(iv) The rocky, sandy and broken waste biotope that lies in the southeastern parts of Western Rajasthan desert bear more shrubs than trees. The more important floral representatives are:

Scientific names	Local names	Type of plants
<i>Acacia senegal</i>	Kumut	Thorny Tree
<i>Acacia nilotica</i>	Desi Babul	Thorny Tree

<i>Salvadora oleoides</i>	Jar, Piloo	Tree
<i>Tecomella undulata</i>	Rohira	Tree
<i>Euphorbia caducifolia</i>	Thunhar, Thor	Shrub (fleshy, most important constituent)
<i>Grewia tenax</i>	Gangi	Shrub
<i>Commiphora mukul</i>	Gugar	Shrub
<i>Barleria acanthoides</i>	Vajradanti	Herb (Grass)
<i>Corchorus spp.</i>	Chamgas	Herb (Grass)
<i>Oropetium thomaeum</i>	Chamgas	Herb (Grass)
<i>Schima nervosum</i>	Chamgas	Herb (Grass)
<i>Panicum spp.</i>		Herb (Grass)
<i>Aristida sp.</i>		Herb (Grass)
<i>Cenchrus catharticus</i>	Bhurat, Burat	Herb (Grass)
<i>Pennisetum conchroides</i>	Dhaman	Herb (Grass)

(v) The saline and alkaline biotope in the coastal flats along the Rann of Kutch and in some of the inland salt and alkaline soils do not support vegetation save some special saline resisting species which is able to withstand pH ranging from 6 to 14. The overall picture of such terrain is a vast treeless expanse. In such flats, grassy patches, running creepers, scattered stunted bushes and trees, shrubs and bareness are characteristics.

The following are the typical floral representatives:

Scientific names	Local names	Type of plant
<i>Acacia nilotica</i>	Babul	Tree (on elevated ground)
<i>Acacia arabica</i>	Babul	Tree "
<i>Tamarix sp.</i>	Lai, Phanus	Tree "
<i>Prosopis juliflora</i>	Zal (Introduced)	Tree "
<i>Prosopis spicegera</i>	Babul	Tree "
<i>Salvadora persica</i>	Mithi Jar	Tree "
<i>Haloxylon salicornicum</i>	Lana	Shrub
<i>Salsola spp.</i>		Herb. Closely packed tufts grow up to 30 cm in diameter.
<i>Suaeda fruticosa</i>		Herb
<i>Elusine spp.</i>	Tantia, Sawan	Herb (Grass)
<i>Eragrostis spp.</i>		Herb (Grass)
<i>Cyperus rotundus</i>		Herb (Moth grass)

The coastal sand-dunes however bear some soil binding creepers and grass such as :

<i>Laportea spartium</i>	Khip	Creeper (Soil binder)
<i>Sericostoma pauciflorum</i>	Khurson	Creeper (Soil binder)
<i>Gymnosporia montana</i>	Vingho	Creeper (Scraggy ground cover)
<i>Clerodendron phlomoides</i>	Tarkara	Herb (Grass)

2. Fauna

A comprehensive account of the vertebrates and invertebrates specially of the arthropods has been given by Roonwal (1982). The author has therefore, dealt with the major groups of vertebrates (Except fishes and amphibia) in their ecological set up, in greater details.

The vertebrate animals of the desert, other than the birds are adapted to a specialised environment and have developed tolerance towards tropical heat, loss of water from body due to dehydrating factors, scarcity of food, etc. Underground living and nocturnal activities solve to some extent problems of loss of water and exposure to solar radiation for several ;desert living animals. In microhabitat where they live a special environment is maintained. Microclimate prevails in a microhabitat by having lower temperature, more humidity than outside and also protects the animal from sanddust blows. Such microhabitats are, burrowed tunnels in sandhills or sandy flats, rock crevices, delapidated buildings, ruins or forts where ample shaded hideouts are available, or thick bushes of shrubs or tufted grass. Most of the vegetarians, specially the rodents, live on dry diet which contains 10-12 per cent of water and excrete little, urine concentration is high and faecal matter dry. Moist food when available after rains, is heavily consumed to make up deficiency that the animals undergo when food-availability is scarce. The Indian Gazelle (Chinkara) and the Blackbuck which can run at a speed of 50 km an hour, after exhaustion need water intake which is provided by theconsumption of succulent leaves or sap of plants where no water is available. The Wild Ass, a sure-footed animal with long ears, inhabits the coastal dry sandy belt. It tolerates a considerable degree of dehydration and is able to withstand water-loss of 30 per cent of the body weight (Cloudsley-Thomson 1979 p. 95). With the increase in atmospheric temperature there is some degree of hypothermia in the Wild Ass but not to the degree of the Camel. The latter moves a long distance for a drink from pool or tank and at a time it ingests water more than 25 per cent of its body weight.

Desert carnivores such as fox, jackal, wolf, small or lesser cats and mongoose meet water requirement to some extent from the body fluid of their prey besides drinking from pools and puddles, if available. Such carnivores avoid the heat of the day by staying in excavated burrows in sanddunes, rock-sheds, crevices, caves or in bushes, or shifting with shades of dunes and hillocks as the sun moves from east to west. Lizards are numerous in deserts and conspicuous. The more important animals that inhabit the arid and semi-arid tracts, enumerated habitatwise, are :

Habitat		Associated species	Special features
		Mammals	
Temporary (unstable)	Sand-dunes	Gerbil <i>Meriones hurrianæ</i>	Digs in burrows, feeds on seeds : Diurnal.
		<i>Gerbillus gleadowi</i>	Digs in burrows, feeds on seeds : Diurnal.

	Desert Fox <i>Vulpes vulpes</i>	Feeds on rodents, ground birds and arthropods.
	Gazelle <i>Gazella gazella</i>	Feeds on all available grass and shrubs except <i>Calotropis</i> .
	Reptiles Sandfish <i>Ophiomerus tridactylus</i>	Largely a termite-feeder.
	Sand Lizard <i>Acanthodactylus cantoris</i>	Insect-feeder.
Sand-dunes permanent or Sandhills	Gerbil <i>Meriones hurrianæ</i>	The commonest rodent, represents about 42 per cent of the rodent population.
	<i>Gerbillus gleadowi</i> <i>Gerbillus nanus</i> <i>Tatera indica</i>	
	Hedgehogs <i>Hemiechinus auritus</i> <i>Paraechinus micropus</i>	Insect feeder, shelters in burrows at the bases of bushes, nocturnal.
	Blacknaped Hare <i>Lepus nigricollis</i>	Feeds on grass seeds, cucurbits, cultivated seeds, nocturnal.
Sandy plains, cultivated and pasture-land	Gazelle <i>Gazella gazella</i>	Feeds on shrubby vegetation, keeps in small parties.
	Blackbuck <i>Antelope cervicapra</i>	Forages in grass, shrubs and cropland on all types of vegetation except alkaloid latex-bearing plants.

Nilgai
Boselaphus tragocamelus

Gerbils
Meriones hurrianae
Tatera indica
Gerbillus gleadowi
Nesokia indica

Found in crop field
consuming harvested
seeds.

Wild Pig
Sus scrofa

Once common, at present
infrequently met with.

Hedgehogs
Hemiechinus auritus
Paraechinus micropus
Paraechinus intermedius

Desert Fox
Vulpes vulpes

Jackal
Canis aureus

Rare.

Wolf
Canis lupus

Desert Cat
Felis libyca

Jungle Cat
Felis chaus

Caracal
Felis caracal

Near extinct, doubtfully
exists in Sirohi-Jalor and
Bikaner areas.

Reptiles
Spinytailed Lizard
Uromastix hardwickii

Vegetable feeder.

Gecko
Stenodactylus orientalis

Insect feeder.

Gecko
Cyrtodactylus scabar

Insect feeder.

	Grass Skink <i>Ophiomerus tridactylus</i>	Insect feeder.
	Rat Snake <i>Ptyas mucosus</i>	Feeds on insects and small vertebrates.
	Black Krait <i>Bungarus caeruleus</i>	Do
	Cobra <i>Naja naja</i>	Do
	Russel's Viper <i>Vipera russeli</i>	Do
	Saw-scaled Viper <i>Echis carinatus</i>	Do
Rocky, gravelly and broken terrain	Mammals <i>Presbytis entellus</i>	Generally in troops feeding on all wild fruits, leaves, buds.
	Rhesus Monkey <i>Macaca mulatta</i>	Occupies trees, more associated with human habitation.
	Indian Pangolin <i>Manis crassicaudata</i>	Rare
	Wolf <i>Canis lupus</i>	Rare
	Desert Fox <i>Vulpus vulpus</i>	Not uncommon.
	Striped Hyaena <i>Hyaena hyaena</i>	Rare.
	Mongoose <i>Herpestes auropunctatus</i> <i>Herpestes edwardsi</i>	Frequently met with. Not uncommon.
	Indian Hare <i>Lepus nigricollis</i>	Common
	Fivestriped Squirrel <i>Funambulus pennanti</i>	Not uncommon, affects stunted trees, specially <i>Acacia</i> and <i>Azadirachta indica</i> .

	Mice <i>Mus cervicolor</i> <i>Mus platythrix</i>	
	Rat <i>Rattus cutchicus</i>	
	Gerbil <i>Gerbillus leadowi</i>	
	Reptiles <i>Agama agilis</i>	
	Monitor Lizard <i>Varanus griseus</i>	Feeds on insects, lizards, snakes, birds.
	Garden Lizard <i>Calotes versicolor</i>	
	Blind Snake <i>Typhlops braminus</i>	
	Indian Sand Boa <i>Erx johni</i>	Feeds on insects, scorpions, rats, jerbils, squirrels.
	Ornamental Diadem <i>Sphaerosophis diadema</i>	Uncommon. Feeds on gerbils and rats.
Coastal saline flat and sand-dune desert	Desert Fox <i>Vulpes vulpes</i>	
	Desert Cat <i>Felis libyca</i>	
	Indian Wild Ass <i>Equus hemionus khur</i>	Move in small and large herds on dry flats of Little Rann of Kutch.
	Gerbil <i>Tetera indica</i> <i>Meriones hurrianae</i>	Found on raised ground which remains above the tidal line.
	Kutch Rock Rat <i>Rattus cutchicus</i>	Affects rocky raised ground.

Reptiles

Skink

*Ophiomorus tridactylus**Mabuya macularia**Varanus bengalensis*

The bats inhabiting the desert area are represented by 21 species (Sinha 1980). Since the bats are not confined to a particular habitat being winged animals, they traverse long distances and invade orchards and gardens in and around villages and towns and also fly about the dry, desolate terrain. Some important species belonging to 15 genera are *Pteropus* sp., *Rousettus* sp., *Cynopterus* sp., *Rhinopoma* sp., *Taphozous* sp., *Megaderma* sp., *Rhinolopha* sp., *Hipposideros* sp., *Tadarida* sp., *Myotis* sp., *Eptesicus* sp., *Eptesicus* sp., *Pipistrellus* spp., *Hesperoptenus* sp., *Barbestella* sp. and *Scotophilus* sp. (Roonwal 1982 p. 25); there are more species of carnivorous bats than frugivorous, the largest is the Flying Fox *Pteropus giganteus* and the smallest, the Pipestrel, *Pipistrellus minus*.

The mammalian fauna of the arid tract is represented by 65 species of the Orders Insectivora, Chiroptera, Primates, Pholidota, Carnivora, Artiodactyla, Lagomorpha, Rodentia, and Perissodactyla. The zoogeographical affinities as analysed by Prakash (1975), show that 32 species belong to Palaearctic, 30 Oriental and three endemic. The percentage representation is therefore 50 Palaearctic, 44 Oriental and six endemic.

(d) *Ecological distribution of Birds*

Ecosystems that are recognizable with respect to the distribution of birds in the arid and semi-arid areas, habitatwise, are :

- (i) Temporary sand-dunes and sandy plains,
- (ii) Fixed dunes and interdune grassy pasture.
- (iii) Arable plains, valleys, groves and gardens.
- (iv) Stony and gravelly stunted thorny forest and scrub.
- (v) Tropical dry deciduous, thorny and mixed tree forest.
- (vi) Coastal wind-blown sand-dunes, sandy flats and grassy plains.
- (vii) Aquatic habitat.

(i) Temporary sand-dunes and sandy plains.

Temporary sand dunes are found in western and northwestern part of Rajasthan. These are formed as a result of strong and persistent wind blowing southwest and are placed either transversely or longitudinally. *Barakhan* types of dunes are common in the central parts of Rajasthan desert. Little shade or shelter, great heat in summer and cold in winter, dust-storm, aridity and insufficient annual precipitation produce a grim picture of a lifeless terrain. Even under such climatic adversities there are a few species of birds which hold the area. Such examples are the Creamcoloured Courser (*Cursorius cursor*), Imperial Sandgrouse (*Pterocles orientalis*), Crested Lark (*Galerida cristata*), Rufousfronted Wren-Warbler (*Prinia buchanani*), Desert Wheatear (*Oenanthe deserti*) and the Barne's Chat (*Oenanthe finschi*).

(ii) Fixed dunes and interdune grassy pasture.

Thick deposits of older alluvial sand together with calcareous zone at different depths support light scrubby, thorny and grassy vegetation which are affected by several species of birds. Such species are the Bluelegged Button Quail (*Turnix suscitator*), Houbara (*Chlamydotis undulata*), Great Indian Bustard (*Ardeotis nigriceps*), Indian Courser (*Cursorius coromandelicus*), Yellowwattled Lapwing (*Vanellus malabaricus*), Spotted Sandgrouse (*Pterocles exustus*), Large Pintail Sandgrouse (*Pterocles alchata*), Blackcrowned Finch-Lark (*Ermopterix nigriceps*) and the Redwinged Bush Lark (*Mirafra erythroptera*).

(iii) Arable plains, valleys, groves and gardens.

Plains and valleys which retain adequate moisture after precipitation support such crop as millet, wheat, sorghum, green vegetables, oilseeds and tubers. Such terrain are watered by artificial reservoirs. The precipitation also keep the soil surface moist for sometime as water percolates to the undersurface which helps the crop to grow fast and only when the moisture is lost, water supply is made from storage tanks and deep wells, deep tubewells and through irrigation channels. All temporary and perennial water sources provide water to cattle, goat, sheep, camel and other vertebrates. The standing crop and water attract vast numbers of birds-migratory, locally shifting population and resident birds. A few commoner wintering birds are the common Crane (*Anthropoides virgo*), Rosy Pastor (*Sturnus roseus*), Striolated Bunting (*Emberiza striolata*), Pale Harrier (*Circus macrourus*), and the Lapwing (*Vanellus vanellus*). The local migrants that frequent such plains are the Button Quail (*Turnix tanki*), Grey Quail (*Coturnix coturnix*), and the Rain Quail (*Coturnix coromandelicus*). Resident species associated with cultivation that have some role to play in agricultural economy are the Peafowl (*Pavo cristatus*), Grey Partridge (*Francolinus pondicerianus*), Rock Pigeon (*Columba livia*), Ring Dove (*Streptopelia decaocto*), Roseringed Parakeet (*Psittacula krameri*), Spotted Owlet (*Athene brama*), Common Myna (*Acridotheres tristis*), House Sparrow (*Passer domesticus*) and the House Crow (*Corvus splendens*).

Groves and gardens serve as shelters for birds in summer heat. Some birds nest in such habitats in their respective breeding seasons. The commonest birds that affect such habitats are the Roseringed Parakeet (*Psittacula krameri*), Common Hawk-Cuckoo (*Cuculus varius*), Koel (*Eudynamys scolopacea*), Scops Owl (*Orus bakkamoena*), Spotted Owlet (*Athene brama*), Indian Roller (*Coracias benghalensis*), Brownheaded Pygmy Woodpecker (*Picoides nanus*), Golden Oriole (*Oriolus oriolus*), Indian TreePie (*Dendrocitta vagabunda*) and the Whitecheeked Bulbul (*Pycnonotus leucogenys*).

(iv) Stony and gravelly stunted thorny forest and scrub.

The rocky, broken, gravelly flat bare plains, undulating terrain and dry wrinkled hills are more or less covered with thin soil which is able to retain a small amount of moisture. As a result, it generally supports dry deciduous vegetation, xerophytic plants, stunted trees, thorny shrubs, dry thick bushes and patchy coarse grass. During the rainless period under the scorching sun and summer heat, the terrain turns barren, exposing rocks, parched and dehydrated. Life returns to such terrain with rains when green patches appear to support insect and other

animals. Birds that inhabit such a terrain are the Great Indian Bustard (*Ardeotis nigriceps*), Bush Quail (*Perdica argoondah*), Short-toed Eagle (*Circaetus gallicus*), Kestrel (*Falco tinnunculus*), Painted Sandgrouse (*Pterocles indicus*), Stone Curlew (*Burhinus oedicnemus*), Short-toed Lark (*Calandrella brachydactyla*), Brown Rock Pipit (*Anthus similis*), Brown Rock Chat (*Cercomela fusca*), Redtailed Chat (*Oenanthe xanthopyrma*), Pied Chat (*Oenanthe picata*), Jungle Wren-Warbler (*Prinia sylvatica*), Whitecheeked Bulbul (*Pycnonotus leucogenys*) and the Whitewinged Tit (*Parus nuchalis*)

(v) Tropical dry deciduous forest habitat.

The Great Indian Desert which is limited to the west of the Aravallis has entirely a different physiography compared to the forest covered ranges that run from northeastern parts of Rajasthan to northwestern and western parts of Gujarat with a few gaps of semi-arid plains. It is not within the scope of this account to cover the birds that reside in such deciduous and semi-deciduous forest covering the hills, the highest elevation being the Mt. Abu (1721 m) in Rajasthan, and in Saurashtra, the Girnar (590 m) and the Barda Hills (410 m). However there are several species that have flexibility in movement from the deciduous forest to dry deciduous thorny trees and xerophytic shrubs and grass-cover that flourish at the foot of hills and in contiguous plains. Such species adapted to both the types of habitats are the Jungle Bush Quail (*Perdica asiatica*), Spurfowl (*Galloperdix spadicea*), Painted Partridge (*Francolinus pictus*), Crow-Pheasant (*Centropus sinensis*), Yellowfronted Woodpecker (*Picoides maharattensis*), Pygmy Woodpecker (*Picoides nanus*), and the Jungle Babbler (*Turdoides striatus somervillei*). Some birds like the Magpie-Robin (*Copsychus saularis*), Fantail Flycatcher (*Rhipidura aureola*) and the Tickell's Blue Flycatcher (*Muscicapa tickellie*), flit among shrubs and thorny trees and pour out their melodious notes. Several species of doves move about the forest fringes and in undulating hillocks and plains denoting their presence by their specific low deep notes repeated at intervals. Melodious call of the Blackheaded Oriole (*Oriolus xanthornus*), loud and shrill of the Black Cuckoo-Shrike (*Coracina melanoptera*), Large Cuckoo-Shrike (*Coracina novaehollandiae*), Rufousbacked Shrike (*Lanius schach*), and the Wood Shrike (*Tephrodornis pondicerianus*) resonate the forest area. Besides the above mentioned birds there are several species that occupy the forest canopy as well, move out of forest to the adjoining light woods, fallow land and cultivated tracts, sprinkled with patches of trees near or round about human habitation. Such species are the Magpie-Robin (*Copsychus saularis*), Blackheaded Myna (*Stumus pagodarum*), Little Minivet (*Pericrocotus peregrinus*), Yellowthroated Sparrow (*Petronia xanthocollis*), Grey Tit (*Parus major*), Jungle Wren-Warbler (*Prinia sylvatica*), and the Redvented Bulbul (*Pycnonotus cafer*) that flit from well-foliaged trees, shrubs and grass. Nightjars viz., *Caprimulgus macrurus*, *Caprimulgus europeas* and *Caprimulgus affinis* are invariably met with at dusk in thin forest fringes, dusty unmetalled roads, fallow land and cultivated tracts. The birds of prey that resort in the forest, though not restricted in movement, forage in vast areas over valleys, hillocks and plains. Such species are the Honey Buzzard (*Pernis ptilorhynchus*), Crested Hawk-Eagle (*Spizaetus cirratus*), White-eyed Buzzard-Eagle (*Butastur teesa*), and the Crested Serpent Eagle (*Spilornis cheela*). The ruffling noise of leaves covering the forest floor indicated the presence of the Jungle Bush Quail, (*Perdica asiatica*), the Spurfowl (*Galloperdix spadicea*), Painted Partridge (*Francolinus pictus*) Crow-Pheasant (*Centropus sinensis*) and babblers. Tapping on larger and older trees by the Yellowfronted Woodpecker, Pygmy Woodpecker and the Golden Woodpecker (*Dinopium benghalense*) is heard throughout the day in forests specially in thin and mixed forest areas.

(vi) Coastal wind blown sand-dunes, sandy flats and grassy plains.

The coastal wind blown sand-dunes, sandy belt along beach and saline depression of the Rann, also the dry and waste expanse in the northern portion of Kathiawar from Dharangadhra to Okha and south up to Veraval, present desert conditions. The whole belt is practically treeless, barren and in some areas rocky, separated from the inner cultivable plains and valleys. In Kutch the low-lying flat plains, "Banni", running almost parallel to the coast is covered with short closely packed tufts of grass. Such flats invite large numbers of small birds such as the Desert Warbler (*Sylvia nana*), Streaked Wren-Warbler (*Prinia gracilis*), Plain Wren-Warbler (*Prinia subflava*), Tawny Pipit (*Anthus campestris*), Small Skylark (*Alauda gulgula*), Sandlark (*Calandrella raytal*), Sykes's Crested Lark (*Galerida deva*), Crested Lark (*Galerida cristata*), and the Large Desert Lark (*Alaemon alaudipes*). The sandy sea-beach, tidal creeks and salt-pans are visited by several aquatic species comprising sandpipers, stints, stilts, dunlin, curlew, plovers and others discussed under Aquatic habitat (Chapter V-vii, p.)

(vii) Aquatic habitat.

In the desert areas water sources are very limited. Depending upon the annual precipitation, water levels in perennial tanks and lakes are maintained. Other source is the deep-bore mechanised underground water-supply which helps to maintain the optimum water level for irrigation, should the rains fail. Throughout the desert area ephemeral tanks are formed in depressions that gradually dry up with the approach of dry season. Rivers and ravines which are also seasonal leave some puddles rocky and boulderstrewn beds in their course. A few running streams in the hilly terrain specially in forested areas of the Aravallis and the Gir are also found. All such waters, from smallest puddle to the largest lakes, meet the water requirement not only to birds but also to other animals. Some lakes and pools are also saline such as the Sambhar Lake (Jaipur-Nagpur districts) and Didwana Lake (Nagaur district) in Rajasthan that exist at the eastern fringe of the Thar Desert. Since these lakes contain enormous numbers of brine shrimps, aquatic insects and their larvae, snails, algae and also submerged vegetation, such living organisms attract a great number of birds such as the Flamingo (*Phoenicopterus roseus*), the Lesser Flamingo (*Phoeniconias minor*) (Sambhar Lake, A.K.M. December 1957, January 1958), Avocet (*Recurvirostra avosetta*) (Sambhar Lake, A.K.M. January 1958), Brownheaded Gull (*Larus brunnicephalus*), Curlew (*Numenius arquata*), Bartailed Godwit (*Limosa lapponica*), Spotted Redshank (*Tringa erythropus*), Common Sandpiper (*Tringa hypoleucos*), and a large number of ducks, teals and pochards.

The sandy arid coastal belt of Kutch and southwestern Kathiawar Peninsula facing the sea (Gulf of Kutch) hosts a number of waders annually during winter months in large and small flocks and sometimes in mixed parties. Such waders are found not only on sea-shores but some also occupy tidal marshes, creeks, lagoons and salt-pans. The commoner visitors are the Grey Plover (*Pluvias squatarola*), Large Sand Plover (*Charadrius leschnaulti*), Whimbrel (*Numenius phaeopus*), Curlew (*Numenius arquata*), Common Sandpiper (*Tringa hypoleucos*), Dunlin (*Calidris alpina*), Curlew Sandpiper (*Calidris testacea*) and Ruff and Reeve (*Philomachus pugnax*). Some species that visit the sea-coast for fishing are the Brownheaded Gull (*Larus brunnicephalus*), Blackheaded Gull (*Larus ridibundus*), Eastern Herring Gull (*Larus fuscus*) and small looseflocks of the Little Tern (*Sterna albifrons*). On the sea-shore and at tidal creeks the

Indian Reef Heron (*Demigretta asha*) is occasionally seen wading singly in shallow water specially during receding tide.

The Rann which is a flat strip of salt encrusted featureless waste expanse of sunbaked mud gets inundated in sea-water driven by gust of south winds from the sea and also brackish and fresh water drained from upland by ephemeral rivers and streams active during the rains. This waste expanse turns into an attractive 'flamingo city' when the water reaches a favourable level. Large number of flamingos (*Phoenicopterus roseus*) then congregate to erect vertical clay nests projecting above the water level for nesting. The Lesser Flamingo (*Phoeniconaias minor*), and the Avocet (*Recurvirostra avosetta*) share the breeding ground, but in small numbers, to breed.

Freshwater reservoirs, puddles and pools, lakes, specially the perennial ones that contain adequate submerged and floating vegetation and marginal reed and grass cover, harbour fish, crustaceans, worms, molluscs and insects. Such waters are congenial habitat of the Little Grebe (*Podiceps ruficollis*), Cormorant (*Phalacrocorax niger*), Spotbill Duck (*Anas poecilorhyncha*), Lesser Whistling Teal (*Dendrocygna javanica*), Cotton Teal (*Nettapus coromandelianus*), and the Comb Duck (*Sarkidiornis melanotos*). The Night Heron (*Nycticorax nycticorax*), Little Egret (*Egretta garzetta*), Grey Heron (*Ardea cinerea*), Painted Stork (*Ibis leucocephalus*), and the Openbill Stork (*Anastomus oscitans*), though partly terrestrial, are dependent on such marshes. There are several species which are regular winter visitors that flock to these waters. Such species of more importance are the Blacknecked Grebe (*Podiceps nigricollis*), Rosy Pelican (*Pelicanus onocrotalus*), Greylag Goose (*Anser anser*), Barheaded Goose (*Anser indicus*), Common Shelduck (*Tadorna tadorna*), Pintail Duck (*Anas acuta*), Garganey (*Anas querquedula*), Shoveller (*Anas clypeata*), Redcrested Pochard (*Netta rufina*), Common Pochard (*Aythya ferina*), a White-eyed Pochard (*Aythya nyroca*), and the Tufted Pochard (*Aythya fuligula*). Besides the above-mentioned waterfowl, the margins and shallows are affected by a large numbers of sandpipers, snipes, stints, stilts, and plovers.

Thick rush and reeds in marshy areas, studded with ephemeral tanks, found specially in northwestern Saurashtra and in Banni of Kutch provide adequate habitat for marsh dwellers such as the Little crane (*Porzana parva*), Brown Crake (*Amauornis akool*), Whitebreasted Waterhen (*Amauornis phoenicurus*), Moorhen (*Gallinula chloropus*), and the Coot (*Fulica atra*). Smaller birds, frequently overlooked, are of great interest. Such examples are the Paddyfield Warbler (*Acrocephalus agricola*), and the Brown Leaf Warbler (*Phylloscopus collybita*), that generally affect swampy grass and reed belts.

In the wet marshland there are some birds of prey that are dependent on aquatic animals like waterfowl, waders, gallinules, fish, frogs and smaller creatures as crabs, molluscs and insects. The more important of such raptors are the Brahminy Kite (*Haliastur indus*), Great Spotted Eagle (*Aquila clanga*), Pallas's Fishing Eagle (*Haliaeetus leucoryphus*), Marsh Harrier (*Circus seruginosus*), and the Osprey (*Pandion haliaetus*).

Wet areas in forests are limited to river beds, ravines, drying pools of stagnant water or some running streams. Some aquatic birds as the Black Ibis (*Plegadis falcinellus*) (Gir National Park), Whitenecked Stork (*Ciconia episcopus*), Common Kingfisher (*Alcedo atthis*), Whitebreasted

* Recorded in 1962 by B. Biswas, also observed by A.K.M. in February 1984.

Kingfisher (*Halcyon smyrensis*), Redwattled Lapwing (*Lobivanellus indicus*), Large Egret (*Ardea alba*), Little Egret (*Egretta garzetta*), Common Sandpiper (*Gallinago gallinago*) and the Fishing Owl (*Bubo zeylonicus*), are invariably associated with wet areas.(e)

Zoogeographical distribution:

The avifauna of the arid and semi-arid areas of northwestern India is represented by species from different zoogeographical regions (faunal areas), the major units of such regions mentioned below have been recognized by Darlington (1957). The 'Faunal Type' (Voous 1960) which reflects characteristic elements of the Regional fauna has also been indicated in terms of geographical areas to determine the distinctiveness between the fauna of different areas. Such migratory and residential species, some species of the latter category being 'endemic' in the Indian subcontinent, are :

Zoogeographical Region (1)	Faunal Type (2)	Climatic Zone and terrain (3)	Name of species (4)	Status Category (5) Migratory = M Resident = R Endemic = E
Holarctic	Arctic	Tundra climatic & birch zone of boreal region of N. Hemisphere	Grey Plover <i>Pluvias squatarola</i>	M
			Temminck's Stint <i>Calidris temmincki</i>	M
			Dunlin <i>Calidris alpina</i>	M
			Curlew Sandpiper <i>Calidris testacea</i>	M
			Whitefronted Goose <i>Anser albifrons</i>	M
	Holarctic	Cold, temperate and subtropical region of Northern Hemisphere	Whooper Swan <i>Cygnus cygnus</i>	M (Very rare)
	Holarctic	Cold, temperate and subtropical regions of Northern Hemisphere	Pintail <i>Anas acuta</i>	M
			Common teal <i>Anas crecca</i>	M

(1)	(2)	(3)	(4)	(5)
			Mallard <i>Anas platyrhynchos</i>	M
			Gadwal <i>Anas strepera</i>	M
			Shoveller <i>Anas chrypeata</i>	M
			Goshawk <i>Accipiter gentilis</i>	M
			Kentish Plover <i>Charadrius alexandrinus</i>	M
			Whimbrel <i>Numenius phaeopus</i>	M
			Common Sandpiper <i>Tringa hypoleucos</i>	M
			Fantail Snipe <i>Gallinago gallinago</i>	M
			Common Tern <i>Sterna hirundo</i>	M
			Shorteared Owl <i>Asio flammeus</i>	M
			Swallow <i>Hirundo rustica</i>	M
			Grey Shrike <i>Lanius excubitor</i>	R
			Raven <i>Corvus corax</i>	M
			Wheatear <i>Oenanthe oenanthe</i>	M
Holarctic	Palearctic	Cold temperate and subtropical region of the northern half of the Old World	Grey Heron <i>Ardea cinerea</i>	R

(1)	(2)	(3)	(4)	(5)
			Bittern <i>Botaurus stellaris</i>	R
			White Stork <i>Ciconia ciconia</i>	M
			Black Stork <i>Ciconia nigra</i>	M
			Grey Lag Goose <i>Anser anser</i>	M (Rare)
			Barheaded Goose <i>Anser indicus</i>	M (Rare)
			Brahmini Duck <i>Tadorna ferruginea</i>	M
			Common Shelduck <i>Tadorna tadorna</i>	M
			Wigeon <i>Anas penelope</i>	M
			Garganey <i>Anas querquedula</i>	M
			Common Pochard <i>Aythya ferina</i>	M
			Tufted Pochard <i>Anas fuligula</i>	M
			Scaup Duck <i>Anas marila</i>	R
			Sparrow-Hawk <i>Accipiter nisus</i>	
			Imperial Eagle <i>Aquila heliaca</i>	M
			Whitetailed Eagle <i>Haliaeetus albicilla</i>	M

(1)	(2)	(3)	(4)	(5)
			Pale Harrier <i>Circus macrourus</i>	M
			Montagu's Harrier <i>Circus aeruginosus</i>	M
			Hobby <i>Falco subbuteo</i>	M
			Button Quail <i>Turnix tanki</i>	R (locally migratory)
			Common Crane <i>Grus grus</i>	M
			Water Rail <i>Rallus aquaticus</i>	M
			Coot <i>Fulica atra</i>	M and also resident
			Lapwing <i>Vanellus vanellus</i>	M
			Little Ringed Plover <i>Charadrius dubius</i>	R and local migrant
			Lesser Sand Prover <i>Charadrius mongolus</i>	M
			Curlew <i>Numenius arquata</i>	M
			Blacktailed Godwit <i>Limosa limosa</i>	M
			Redshank <i>Tringa totanus</i>	M
			Marsh Sandpiper <i>Tringa nebularia</i>	M
			Green Sandpiper <i>Tringa ochropus</i>	M

(1)	(2)	(3)	(4)	(5)
			Wood Sandpiper <i>Tringa glareola</i>	M
			Ruff and Reeve <i>Philomachus pugnax</i>	M
			'Blackheaded Gull <i>Larus ridibundus</i>	M
			Pallas's Sandgrouse <i>Syrhaptes paradoxus</i>	M (Very rare)
			Blue Rock Pegeon <i>Columba livia</i>	R
			Cuckoo <i>Cuculus canorus</i>	R
			European Nightjar <i>Caprimulgus europaeus</i>	M
			European Bee-eater <i>Merops apiaster</i>	M (Occasional Summer visitor)
			European Roller <i>Coracias garrulus</i>	M
			Wryneck <i>Jynx torquilla</i>	M
			Crested Lark <i>Galerida cristata</i>	M
			Short-toed Lark <i>Calendrella cineria</i>	M
			Collard Sand Martin <i>Riparia riparia</i>	M
			Grey Shrike <i>Lanius excubitor</i>	R
			Redbacked Shrike <i>Lanius collurio</i>	M (on passage)

(1)	(2)	(3)	(4)	(5)
			Golden Oriole <i>Oriolus oriolus</i>	R and partly migrant
			Rosy Pastor <i>Sturnus roseus</i>	M
			Starling <i>Sturnus vulgaris</i>	M
			Common Myna <i>Acridotheres tristis</i>	R
			Spotted Flycatcher <i>Muscicapa striata</i>	M (Autumn passage migrant)
			Readbreasted Flycatcher <i>Muscicapa parva</i>	M
			Thickbilled Warbler <i>Acrocephalus agricola</i>	M & partly resident
			Paddyfield Warbler <i>Acrocephalus agricola</i>	M
			Booted Warbler <i>Hippolais caligata</i>	M
			Whitethroat <i>Sylvia communis</i>	M (autumn)
			Lesser Whitethroat <i>Sylvia curruca</i>	M
			Dull Green Leaf Warbler <i>Phylloscopus trochiloides</i>	M
			Bluethroat <i>Erithacus svecicus</i>	M
			Isabelline Chat <i>Oenanthe isabellina</i>	M

(1)	(2)	(3)	(4)	(5)
			Grey Tit <i>Parus major</i>	R
			Tree Pipit <i>Anthus hodgsoni</i>	M
			Blyth's Pipit <i>Anthus godlewskii</i>	M
			Yellow Wagtail <i>Motachilla flava</i>	M
			Yellowheaded Wagtail <i>Motachilla citreola</i>	M
			Grey Wagtail <i>Motachilla cinrea</i>	M
			White Wagtail <i>Motachilla alba</i>	M
			Common Rosefinch <i>Carpodacus erythrinus</i>	M
			Reed Bunting <i>Emberiza schoeniclus</i>	M
Holarctic Region	Siberian (N.Palae- arctic)	Boreal climatic zone in Palaeartic Region	Demoiselle Crane <i>Anthropoides virgo</i>	M
			Jack Snipe <i>Gallinago minima</i>	M
			Green Leaf Warbler <i>Phylloscopus trochiloides</i>	M
			Redthroated Thrush <i>Turdus ruficollis</i>	M
	Mongo- lian Tibetan (C.Palae- arctic)	Middle Asiatic cold, high steppes	Black Vulture <i>Aegypius monachus</i>	

(1)	(2)	(3)	(4)	(5)
			Eastern Calandra Lark <i>Melanocorypha bimaculata</i>	M
I n d i a n subregion	Dry and wet tropical zone		Indian Shag <i>Phalacrocorax fuscicollis</i>	E
			Lesser Whistling Teal <i>Dendrocygna javanica</i>	R
			White-eyed Buzzard <i>Butastur teesa</i>	R
			King Vulture <i>Sarcogyps calvus</i>	R
			Indian Whitebacked Vulture <i>Gyps indicus</i>	R
			Painted Partridge <i>Francolinus pictus</i>	E
			Grey Partridge <i>Francolinus pondicerianus</i>	E
			Blackbreasted Rain Quail <i>Conturnix coromandelica</i>	E
			Jungle Bush Quail <i>Perdica argoondah</i>	E
			Red Spurfowl <i>Galloperdix spadicea</i>	E
			Grey Junglefowl <i>Gallus sonneratii</i>	E
			Common Peafowl <i>Pavo cristatus</i>	E
			Sarus Crane <i>Grus antigone</i>	E
			Great Indian Bustard <i>Ardeotis nigriceps</i>	E
			Lesser Florican <i>Sypheotides indica</i>	E

(1)	(2)	(3)	(4)	(5)
			Indian Courser <i>Cursorius coromandelicus</i>	
			Redwattled Lapwing <i>Vanellus indicus</i>	E.
			Indian Skimmer <i>Rynchops albigollis</i>	E
			Alexandrine Parakeet <i>Psittacula eupatria</i>	E
			Blossomheaded Parakeet <i>Psittacula cynocephala</i>	E
			Large Hawk-Cuckoo <i>Cuculus varius</i>	E
			Sirkeer Cuckoo <i>Taccocua leschenaultii</i>	E
			Dusky Horned Owl <i>Bubo coromandus</i>	R
			Barred Jungle Owlet <i>Glaucidium radiatum</i>	E
			Spotted Owlet <i>Athene brama</i>	R
			Mottled Wood Owl <i>Strix ocellata</i>	E
			Grey Horbill <i>Tockus birostris</i>	E
			Green Barbet <i>Megalaima zeylanica</i>	E
			Lesser Goldenbacked Woodpecker <i>Dinoipium benghalense</i>	E
			Indian Pitta <i>Pitta brachyura</i>	E

(1)	(2)	(3)	(4)	(5)
			Redwinged Bush Lark <i>Mirafra erythroptera</i>	E
			Ashycrowned Finch-Lark <i>Erymopteryx grisea</i>	E
			Rufoustailed Finch-Lark <i>Ammomanes phoenicurus</i>	E
			Sykes's Creasted Lark <i>Galerida deva</i>	E
			Indian Cliff Swallow <i>Hirundo fluvicola</i>	E
			Whitebellied Drongo <i>Dicrurus caerulescens</i>	E
			Brahminy Myna <i>Sturnus pagodarum</i>	E
			Bank Myna <i>Acridotheres ginginianus</i>	E
			Wood Shrike <i>Tephrodornis pondicerianus</i>	R
			Blackheaded Cuckoo-Shrike <i>Coracina melanoptera</i>	E
			Whitebellied Minivet <i>Pericrocotus erythropygius</i>	R
			Marshall's Iora <i>Aegithina nigrolutea</i>	E
			Rufousbellied Babbler <i>Dumetia hyperythra</i>	R
			Large grey Babbler <i>Turdoides malcolmi</i>	E
			Jungle Babbler <i>Turdoides straiatus</i>	R

(1)	(2)	(3)	(4)	(5)
			Whitebrowed Fantail Flycatcher <i>Rhipidura aureola</i>	E
			Rufousfronted Wren-Warbler <i>Prinia buchanani</i>	E
			Jungle Wren-Warbler <i>Prinia sylvatica</i>	R
			Brown Rock Chat <i>Cercomela fusca</i>	E
			Stoliczaka's Bushchat <i>Saxicola macrorhyncha</i>	R
			Indian Robin <i>Saxicoloides fulicata</i>	E
			Whitewinged Black Tit <i>Parus nuchalis</i>	E
			Yellowcheeked Tit <i>Parus xanthogenys</i>	E
			Large Pied Wagtail <i>Motacilla maderaspatensis</i>	E
			Green Munia <i>Esterilda formosa</i>	E
Oriental Region	I n d o Chinese subregion	Tropical and subtropical dry and wet zone	Little Cormorant <i>Phalacrocorax niger</i>	R
			Painted Stork <i>Mycteria leucocephala</i>	R
			Openbill Stork <i>Anastomus oscitans</i>	R
			Whitenecked Stork <i>Ciconia episcopus</i>	R

(1)	(2)	(3)	(4)	(5)
			Blacknecked Stork <i>Ephipporhynchus asiaticus</i>	R
			Spotbill Duck <i>Anas poecilorhyncha</i>	R
			Crested Serpent Eagle - <i>Spilornis cheela</i>	R
			Common Bustard Quail <i>Turnix suscitator</i>	R (subject to local movements)
			Bluebreasted Banded Rail <i>Rallus striatus</i>	R (subject to local movements)
			Brown Crake <i>Amauornis akool</i>	R (subject to local movements)
			Water Cock <i>Gallicrex cinerea</i>	R (Subject to local movements)
			Blackbellied Tern <i>Sterna acuticauda</i>	R
			Green Pigeon <i>Treron phoenicoptera</i>	R (subject to local movements)
			Crow-Pheasant <i>Centropus sinensis</i>	R
			Collared Scops Owl <i>Otus bakkamoena</i>	R
			Eastern Skylark <i>Alauda gulgula</i>	R
			Indian Tree Pie <i>Dendrocitta vagabunda</i>	R
			Redvented Bulbul <i>Pycnonotus cafer</i>	R

(1)	(2)	(3)	(4)	(5)
			Yelloweyed babbler <i>Chrysomma sinense</i>	R
Oriental Region	I n d o Malayan subregion	Evergreen zone	Tropical Wet Pond Heron <i>Ardeola grayii</i>	R
			Cotton Teal <i>Neutapus coromandelianus</i>	R
			Brahminy Kite <i>Haliastur indus</i>	R
			Whitebreasted Waterhen <i>Amaurornis phoenicurus</i>	R
			Pheasant-tailed Jacana <i>Hydrophasianus chirurgus</i>	R
			Bronzewinged Jacana <i>Metopidius indicus</i>	R
			Indian River Tern <i>Sterna aurantia</i>	R
			Brownheaded Pygmy Woodpecker <i>Picoides nanus</i>	R
			Jungle Myna <i>Acridotheres fuscus</i>	R
Oriental Australo- Papuan		Tropical and subtropical winter dry & rain forest zone	Koel <i>Eudynamys scolopacea</i>	R (subject to local movement)
			Large Cuckoo-Shrike <i>Coracina novaehollandiae</i>	R

The study of the avifauna of the arid and semi-arid regions of northwest India reveal that some 322 species of birds are represented from six major zoogeographical regions viz., Arctic, Holarctic (Palearctic of the Old World), Ethiopian, Oriental and Australo-Papuan. Besides these, birds from a combined realm of three regions, Ethiopian, Palearctic and Oriental, better expressed as 'Of the Old World', that occupies the Northern Hemisphere of the Old World are also represented in the desert zone.

The avifauna of the desert is composed of 47 endemic 118 resident and 157 migratory species. Of the total of 322 species, Arctic Region is represented by 17 species (5.0 per cent), Holarctic (Palearctic) 140 species (43.0 per cent), Ethiopian 30 species (10 per cent), and Oriental 96 species (20.80 per cent), of the Old World (Eurasia and Africa 25 species (7.00 per cent), and miscellaneous of 14 species (4.5 per cent) are represented.

(f) Migration:

The arid and semi-arid tracts of northwest India are annually visited by a vast number of migratory birds from beyond its north, northwest and western boundaries. Such birds cross over the high mountain chains of the Himalayas, Karakorum, Hindukush, and ranges of the Sulaiman and Kirthar. Most of them are winter visitors to the Indian subcontinent, their breeding area is largely the cooler part of Eurasia, in the Holarctic Region (Palearctic of the Old World). With the advent of autumn, migratory birds begin to move out from their breeding area which get chilled with the approach of winter. Their mass movement to warmer areas to the temperate and tropical southeastern belts provide them with a comfortable wintering quarter. A substantial quota of such migratory birds are received in the arid plains, undulating hilly attracts and the coastal belt in north and west India. The peak of migration is reached in late autumn and early winter when vast populations of hundreds of species are found to congregate in promising areas of their foraging prospects. By the end of spring and early summer most of the emigrated birds get back to their breeding quarters in small or large flocks. Sometimes mass movement also takes place, as the wintering ground becomes uncogenial for the birds to bear the summer heat and also their urge to nest and breed.

As far as the migration in northwestern parts of India is concerned, some three migratory routes are recognizable, by which the mighty tides of migration flows in and out. Such recognizable routes are:

(1) The Indus valley route: Afghanistan, Baluchistan, northwest Pakistan, Sind, northern and western Gujarat including Kutch. Some species move across the Arabian Sea to northeast Africa and move further south to the African continent. The species involved in migration by the Indus Valley route are the Houbara (*Chlamydotis undulata*), Kashmir Roller (*Coracias garrulus*), European Nightjar (*Caprimulgus europaeus*), European Bee-eater (*Merops apiaster*), Bluecheeked Bee-eater (*Merops superciliosus*), Redbacked Shrike (*Lanius collurio*), Rufous Shrike (*Lanius cristatus*) and the Rock Thrush (*Monticola saxatilis*).

(2) Middle East or West Asian Route : The flyway runs from northern and eastern Europe, through Arabia, Iraq, Iran, Baluchistan to Kutch and Kathiawar Peninsula and through northern Gujarat to Rajasthan in the north and south to Peninsular India. The species that use this corridor are the White Stork (*Ciconia ciconia*), Saker or Cherrug Falcon (*Falco biarmicus cheerug*), Imperial Sandgrouse (*Pterocles orientalis*), Short-toed Lark (*Calandrella cinerea*), Rosy Pastor (*Sturnus roseus*), and the Blackheaded Bunting (*Emberiza melanocephala*).

(3) Trans-Himalayan Route: From the Arctic and Palearctic regions beyond the Himalayas several species of birds, specially waterfowl, cranes, swallows, flycatchers, warblers, buntings and other birds migrate southwards to the Indian subcontinent via different valley-routes, some also directly cross the mountains. Such migratory birds, most of them moving in flocks, large and small, get dispersed over large areas in southern Asia. Such examples that are regularly met with every winter are Gadwall (*Anas strepera*), Pintail Duck (*Anas acuta*),

Barheaded Goose (*Anser indicus*), Greylag Goose (*Anser anser*), Redcrested Pochard (*Netta rufina*), Spotted Redshank (*Tringa erythropus*), and the common Redshank (*Tringa totanus*). Altitudinal movement takes place of such species that breed in Karakorum, Ladakh, the Tibetan mountain chains, and the Himalayas which descends to the lower valleys and the adjoining plains in Upper India spreading over the dry terrain north and west. Such species are the Redheaded Bunting (*Emberiza bruniceps*), Whitecapped Bunting (*Emberiza stewarti*), Indian Tree Pipt (*Anthus hodgsoni*), and the Verditer Flycatcher (*Muscicapa thalassina*).

Besides the above species some birds that reside and breed in the Tibetan and Ladakh lakes and watersheds cross over the mountain chains flocking to the waters of the Indian plains dispersing to an extensive area, such examples are the Great Crested Grebe (*Podiceps cristatus*), Brownheaded Gull (*Larus brunnicephalus*), Barheaded Goose (*Anser indicus*) and the Shelduck (*Tadorna tadorna*). some breeding birds of the Himalayas such as the Hoopoe (*Upupa epops*), Grey Wagtail (*Motacilla cinerea*) and the Kashmir Redstart (*Phoenicurus ochruros*) tide over the severe cold, snow storms and the blizzards that occur in the montane terrain by descending to the lower altitudes.

The arid and semi-arid tracts of northwestern India therefore receive every winter several thousands of migratory birds through all the above routes. Most of them take the same route on their return journey except some species which take the course through west Asia and cross the Arabian Sea to Northeast Africa and some proceed as far south as South Africa. Such species that winter in Africa and return to their summer quarters by a different route are the Rufous Chat (*Erythropygia galactotes familiaris*), Whitethroat (*Sylvia communis*), Kashmir Roller (*Coracias garrulus*), Nightjar (*Caprimulgus europaeus*), and the Spotted Flycatcher (*Muscicapa striata*). For such species the arid tracts of northwest India serve as one way traffic.

There are a large number of migrants to the arid tracts, such species have, more or less, been covered in the list of Zoogeographical distribution of birds (vide pp. 21 to 41).

(g) Coloration of birds in desert environment.

Scorching heat, aridity and glare of light, together with ultraviolet and infra-red radiations are responsible for changes in coloration of the top soils in desert, which also affect pigmentation of plumage of birds producing more or less a neutral colour. Soil surface coloration vary from pale yellow to chrome-yellow over shifting sand-dunes, whereas, permanent sand-dunes are greyish to chrome-lemon. The broken boulderous and stony country and rocky outcrops have varying shades of patchy black and grey to sandy isabelline sprinkled with green hue imparted by scattered vegetation. Plumage pattern of some species of birds closely resemble the environment. The colour of the soil and the plumage blend perfectly with the background of the desert. Such camouflaging is absolutely essential in the vast and wide open terrain which hardly provides hides for birds to escape from predators. Protective coloration therefore, is the major device that helps to save the bird from the predator's notice, specially from the birds of prey and the prowling carnivorous mammals and reptiles. Terrestrial birds specialized to live in the desert environment generally squat on the ground and press themselves on to the soil-surface making themselves obliterate against the sandy background. Such camouflaging is not only a protective device but also helps the birds to collect food-material which are small terrestrial creatures that are unable to detect their feathered foes due to their deceptive colour

and postures merging with the background. Examples of some species that inhabit such desert terrain and have developed adaptive features and coloration are :

Name 1	Habitat 2	Colour of bird 3	Adaptive features 4
Stone Curlew <i>Burhinus oedicnemus</i>	Semi-desert, stony scrub-country, <i>Babool</i> groves, stony hill-sides, dry riverine tracts.	Sandy brown, dark-streaked, broad, buffy bar on closed wings.	Perfectly camouflages during the day sheltering under shady groves or in shrubs. When alarmed, lies low, freezing, neck pressed on ground-appears like dry cowdung.
Cream coloured Courser <i>Cursor cursor</i>	Barren sunbaked mud flats, sandy fallow land.	Sandy buff, head rufous ash-grey with black and white stripes longish china-white legs.	Coloration completely oblitative when bird is still.
Indian Courser <i>Cursorius coromandelicus</i>	Sandy tracts, scrubby waste fallow land.	Sandy brown above, chestnut and black below; crown rufous; long white legs.	Oblitative when shelters under shrubs and in shades
Pintal Sandgrouse <i>Pterocles alchata</i>	Open desert, barren sandy waste and fallow land.	Creamy buff above, underparts white.	Perfectly camouflages when settles on dry open flat with creamy buff ground.
Indian Sandgrouse <i>Pterocles exustus</i>	Dry open barren plains, fallow-land, stony semi-desert and scrubby dry terrain.	Yellowish, sandy grey and buff, female streaked and spotted.	Merges with sandy rocky habitat while squatting.
Spotted Sandgrouse <i>Pterocles senegallus</i>	Stony and sandy waste, dry scrub-plains and salt encrusted flats.	Overall sandy buff and sandy grey.	Coloration oblitative in its habitat when at rest.
Imperial Sandgrouse <i>Pterocles orientalis</i>	Desert and semi-desert sandy plains sand-dunes, salt-encrusted wastes.	Sandy grey and black or pinkish grey, cross-barred and spotted with black and brown	Squatters, oblitative in its habitats.
Painted Sandgrouse <i>Pterocles indicus</i>	Bare stony scrubby, sand-dry foothills.	Buffy brown to buffy fawn, closely barred with black.	Remarkablyoblitativewhen motionless in its habitat.

1	2	3	4
Redwinged Bush Lark <i>Mirafra erythroptera</i>	Stony and gravelly sparsely scrubbed semi-desert.	Fulvous brown streaked with blackish.	Colour particularly obliterative on laterite soil.
Blackcrowned Finch-Lark <i>Eremopterix nigriceps</i>	Sandy wastes and desert cultivation	Very pale and sandy above and white below.	Pale color remarkably adaptive and camouflaging.
Desert Finch Lark <i>Ammomanes deserti</i>	Barren country Stony hill-slopes, rocky ground, fallow land.	Earthy brown tinged with pinkish rufous and brown above white to greyish rufous-pink.	Plumage perfectly obliterated in bare stony environment.
Large Desert Lark <i>Alaemon alaudipes</i>	Desert areas, undulating swells and mounds of drift sand, bare sun-baked salt-encrusted flats.	Sandy grey upper parts, whitish underparts, broad double band on black wings.	Coloration masks completely in sandy environment.
Sand Lark <i>Calandrella raytal</i>	Dry open salty coastal mudflats and dry river beds, among sparse vegetation.	Greyish sandy above, finely streaked with brown; whitish below.	Coloration merges with mudflats and salt-encrusted embankments.
Crested Lark <i>Galerida cristata</i>	Arid, salt-encrusted sandy plains, ploughed and fallow land.	Sandy brown streaked with blackish; white fulvous below; breast boldly streaked with fulvous brown.	Colour masks with sandy greyish brown soils.
Small Skylark <i>Alauda gulgula</i>	Open grassland and cultivation in arid areas.	Above brown, below fulvous-buff, dark fulvous on breast, faintly streaked and spotted with blackish.	Colour obliterative when squats.
Desert Warbler <i>Sylvia nana</i>	Sandy scrub-covered boulder strewn desert and salt mudflats.	Pale greyish-brown above; cream white below.	Obliterative coloration amongst scrubs or while resting motionless on open ground.

GREAT CRESTED GREBE

1. *Podiceps cristatus cristatus* (Linnaeus)

1758. *Colymbus cristatus* Linnaeus, *Syst. Nat.*, ed. 10, 1:35. Type-locality: Sweden.

Local names: Chotili Dubki (Gujarati), Chotili Pāndūbi (Hindi).

Recognition: A diving waterbird with lobed toes and compressed legs, a rudimentary tail, pointed bill and slender neck, a pair of tufts on the top of the head; size that of the Pintail Duck (length 500 mm). Sexes alike.

Sides and back of head bear a dark brown or chestnut ruff; a dark stripe running from the eye to the bill; nape amber brown with some white feathers; upper plumage dark greyish brown; lower parts silky white; secondary feathers of wings white forming a white wing-bar.

Iris carmine-red, with an inner orange ring; bill dark brown; legs and feet outside olive green, inside bright yellowish green.

Distribution: Palaearctic, winters south of its breeding range, including the Indian subcontinent.

Habits and habitat: Migratory; not common; keeps in small parties or in pairs in perennial, deep, large watertanks having sufficient submerged aquatic vegetation, and reed beds wherever available in the arid and semi-arid areas; more common in largertanks along coast of Saurashtra peninsula. Swims about with neck erect; not shy but once startled takes a long run on water surface to take off and when on wings flies fairly fast; food comprises aquatic insects crustaceans, fish, frog etc.

Voice and calls: Silent in winter.

BLACKNECKED GREBE

2. *Podiceps nigricollis nigricollis* Brehm

1831. *Podiceps nigricollis* Brehm, *Hanb. Naturg. Vog. Deutschl.* 963. Type-locality: East Germany.

Local names: Shyāmagreeva Dūbki (Gujarati), Kālā dūbki (Hindi).

Recognition: An enlarged edition of the Little Grebe but darker. Size that of the Cotton Teal (length 330 mm) Sexes alike.

Winter birds have upperparts blackish grey with white secondaries; underparts white; trailing white edge of inner remiges conspicuous in flight.

Iris reddish orange, a silvery ring round pupil; bill grey tipped white; legs and feet greenish to bluishgrey.

Distribution: Discontinuously palaearctic, migrates south of its breeding quarters. Winter visitor to northern and western India including the arid and semi-arid tracts.

Habits and habitat: Rare, affects freshwater marshes containing luxuriant vegetation; food comprises aquatic arthropods, fish, tadpole. Swims in clear water with body submerged but bill protruding; dives without splash and takes refuge in reeds when it scents danger.

Voice and calls: Silent in winter.

LITTLE GREBE

3. *Podiceps ruficollis capensis* Salvadori

1884. *Podiceps capensis* Salvadori, *Ann. Mus. Civ. Genova* (2) 1:252. Type-locality: Shoa, Africa.

Local names: Dūbki (Gujarati), Pāndūbi, Pāntiri, Dūbdūbi, Churakā (Hindi).

Recognition: An aquatic silky-plumed, tailless bird, rounded in appearance with a short pointed bill; size almost that of the Spotted Dove minus its tail; swims low and disappears under water; (length 230 mm). Sexes alike.

Summer plumage: Crown and hind neck dark brown; sides of the head, neck and throat chestnut; upper plumage dark brown; outer flight-feathers pale brown, inner flight-feathers white; breast dark brown; abdomen silky white; flanks and under tail-coverts dark brown.

Winter plumage; Crown and hind neck brown, chin white and neck rufous.

Iris reddish brown; bill black, tipped white; basal part greenishyellow; legs and feet blackishgreen

Distribution: Throughout the Indian subcontinent including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; common; keeps in pairs and parties; affects freshwater tanks, pools, ponds having sufficient submerged aquatic vegetation and animalcules; an expert swimmer and diver, with least suspicion disappears under water but when it feels insecure, it patters along the surface of water and takes to wings; food comprises aquatic arthropods, tadpoles, fishes, its own feathers, etc.; breeding commences with rainy season (August-September); nests in reeds in margins of tanks; nest a shallow depression in the pod of water-weeds based on a tuft of grass or on aquatic plant placed among reeds, often half submerged; clutch composed of three to five eggs, incubated by both the sexes, fermentation of decaying vegetation matter also helps in incubation; incubation period 19-20 days.

Voice and calls: A shrill musical trilling "chick" uttered when disturbed or while communicating with each other.

WHITE OR ROSY PELICAN
4. *Pelicanus onocrotalus* Linnaeus

1758. *Pelecanus onocrotalus* Linnaeus, *Syst. Nat.*, ed. 10, 1:132. Type-locality: Africa, Asia.

Local name: Gūlābi Penā (Gujarati), Gulābi Hāwāsil (Hindi), Pen (Kutch).

Recognition: A heavy ungainly waterbird with an enormous heavy bill and a huge throat pouch. Larger than the vulture (Length 1850 mm, Male, female smaller, otherwise sexes alike).

Upper plumage white with a rosy tinge, specially during breeding time; occipital feathers lanceolate; back of the head bears a tuft of long narrow feathers; primaries and inner web of secondaries brownish black; a tuft of feathers on breast yellow; facial skin yellow to orange; under plumage white.

Iris hazel; bill grey with red edges, pouch yellow; legs and feet flesh-coloured.

Distribution: Southern palaearctic, winters in northern and western India including the arid and semi-arid tracts. Incidentally has been observed to breed in the Great Rann of Kutch.

Habits and habitat: Winter migrant except the population that breeds in the Rann of Kutch; commonly met with on large waters between October and April; keeps in pairs or in small flocks and sometimes over a hundred in number; affects shores, creeks, inland lakes; an expert swimmer and a strong flier; its long, powerful wings and strong strokes help it to lift itself buoyantly into air taking it to great heights very quickly and from such heights it descends in no time to drop in water or taking a perch on a tree; it practices cooperative fishing by driving fishes with wing beats splashing water to shallows and scoop into the shoal with its enormous gular pouch; breeding in the Great Rann commences in February-March. Deserted nests of flamingos are used as nesting-sites, nest-linings provided with the shed feathers of its own and also of the flamingo; clutch consists of two eggs.

Voice and calls: Usually silent, the young croaks and yelps.

GREY OR SPOTTED BILLED OR DALMATIAN PELICAN
5. *Pelicanus philippensis crispus* Bruch

1832. *Pelecanus crispus* Bruch; *Isis*, col. 1109. Type-locality: Dalmatia.

Local names: Chotili Penā (Gujarati), Hāwasil (Hindi).

Recognition: An enormous-billed, huge, squat waterbird with an elastic gular pouch; feathers across forehead form a crescentic line; size larger than the vulture (length 1830 mm). Sexes alike.

Upper plumage greyish white, tips of primaries black; facial skin pink; head-crest shaggy at the back of the head; a large yellow patch at the base of throat.

Iris white; bill plumbeous grey edged with red; pouch yellow to orange; legs and feet greyish black.

Distribution: Palaearctic, winters in upper India, including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory; keeps in pairs or small flocks; affects large expanses of water, both fresh and brackish; an expert swimmer and a fisher, fishing done by cooperative effort by the flock, swimming in semicircle, driving shoals towards the edge of water or shallows by vigorously splashing the water with their wings and collecting fishes by scooping the lower mandible to fill in the elastic pouch. Throughout the day it remains active in water, sometimes preening its plumes on the shores of water, at night roosts on nearby trees; on wings it flies strongly like the geese with steady beat of its large broad wings quickly gaining great height.

Voice and calls: Usually silent, sometimes produces grunts or croaks.

CORMORANT

6. *Phalacrocorax carbo sinensis* (Shaw)

1801. *Pelecanus sinensis* Shaw, *Nat. Misc.* 13: pl. 529. Type-locality: China.

Local names: Jāl kāgdo (Gujarati); Ghogur, Pān-kowwā, Jāl-kowwā (Hindi).

Field recognition: A streamlined expert diving bird with a slender, hook-tipped bill and around stiff tail; size more or less that of the large domestic duck (length 800 mm). Sexes alike.

Upper and lower plumage black with glossy greenish sheen; Wing-coverts and inner remiges bronze, edged with black; facial skin and throat buff-white; in breeding birds, head and neck develop more white feathers; upperparts of neck develop long white filamentous plumes; gular region turns yellow; flanks have large white patches,

Iris deep yellowish green; bill horny brown; legs and feet black.

Distribution: Oriental, spread over the Indian region including the well-watered areas of arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, partly migratory in some areas; seen singly or in small parties on fresh-water wheels, lagoons and tidal creeks; often observed with wings and tail spread out to dry, perched on rocks or trees; captures fishes under water by diving and with submarine movement; food comprises exclusively fishes; while taking off flaps heavily along the surface and once air-borne flies strongly with speed; breeding commences in July which largely depends on water level; nests on trees standing in water in mixed colonies with other waterbirds specially in the company of egrets, herons; nest a platform made of twigs, grass, weeds and other fibres; clutch composes 4-5 eggs, incubated by both the parents, incubation period 23-24 days; both parents tend the chicks and young.

Voice and calls: Generally silent, chicks and young produce wheezy "chooee-chooee" on sighting parents.

INDIAN SHAG

7. *Phalacrocorax fuscicollis* Stephens

1826. *Phalacrocorax fuscicollis* Stephens, in Shaw's *Gen. Zool.* 13(1):91. Type-locality: Bengal.

Local names: Jāl kāgdo (Gujarati); Pān-kowwā (Hindi).

Recognition: Almost like the Large Cormorant but with a fine recurved crest; size **more** or less that of the domestic duck (length 630 mm). Sexes alike.

Breeding birds have a white border to the yellow pouch, white tuft behind the eye and white speckles on the side of the head and neck. Distinguishable from the Large Cormorant in having no white patches on flanks. Upper plumage bronze-black with scaly effect on the back and wings; lower plumage jet black.

Iris bluish green; upper mandible dark brown, lower reddish-horny; legs and feet black.

Distribution: Indian Region, including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident also local migrant; gregarious; found in company with the Little Cormorant occupying the same territory for foraging, roosting and breeding; often seen sitting in upright posture sunning to dry its half-spread wings and tail on ground or perched on trees; dives to capture fishes under water in large numbers, repeatedly throughout the day consuming large quantity of fishes, tadpoles aquatic arthropods. Breeds from August to October; nests in mixed heronries or in company with other cormorants occupying trees standing in water or on margins; nest pattern that of the crow, made of sticks and weeds; clutch comprises 3-6 eggs; both parents incubate and extend after care to chicks and fledgelings.

Voice and calls: No record.

LITTLE CORMORANT

8. *Phalacrocorax niger* (Villiot)

1817. *Hydrocorax niger* Villiot, *Nouv. Dict. Hist. Nat.* 8:88. Type-locality: East Indies = Bengal.

Local names: Nāno Jal Kāgdo (Gujarati); Pān kowwā, Jogrābi (Hindi).

Recognition: A smaller edition of the Large Cormorant, with a shorter, slenderer compressed bill; yellow gular patch absent; size that of the Jungle Crow (length 510 mm). Sexes alike.

Plumage glossy black with a bluish and greenish tinge; upper back and wings silvery grey, feathers outlined in black; throat patch, bordered with white; inbreeding bird's crown develops a few filamentous white feathers and sides of the neck a few hairy plumes; tail wedged-shaped.

Iris greenish brown; bill brown (purple inbreeding birds), legs and feet blackish.

Distribution: Palaearctic and oriental, found throughout the Indian region including the arid and semi-arid tracts in suitable water tanks.

Habits and habitat: Resident, common; keeps in small parties, sometimes congregate in incredible numbers in fresh and brackish water pools and tanks; cooperative hunting by driving the shoal of fish in shallows by splashing the water with their wings and diving to catch, the usual method of collecting fish; food comprises fishes, tadpoles and aquatic insects; when at rest, seen with outspread wings for sunning, usually perched on raised ground, on tree or on a stump; a strong flier, rises with difficulty with long flaps out of water but once air borne usually flies low but swiftly, when covering long distance attains greater height; breeds during rains (July-September); nest made of sticks and twigs, like that of the crow erected on trees standing in water in mixed heronry with egrets, herons, darters, openbills, etc., clutch comprises 4-5 eggs, incubated by both the sexes and of chicks extended by both the partners.

Voice and calls: Usually silent.

DARTER

9. *Anhinga rufa melanogaster* Pennant

1769. *Anhinga melanogaster* Pennant, Indian Zool: 13:12. Type-locality: Cylone (= Sri Lanka) and Java.

Local names: Sārpāgreevā (Gujarati); Pānwā, Pāndubi (Hindi).

Recognition: A long, slender waterbird with a snake-like neck, a small head and spearbeaked resembling the cormorant; size that of the domestic duck (length 900 mm). Sexes alike.

Head and neck brown, a fine line drawn over the eye; sides of the neck streaked; chin, throat and breast white; upper back glossy black; wing-feathers and coverts bear silvery white or grey shaft-streaks; tail fan-shaped while on flight.

Iris yellow; bill blackish brown; legs and feet black.

Distribution: Cosmopolitan. Found throughout the Indian region including the arid and semi-arid tracts of northwestern India wherever suitable water tanks are available.

Habits and habitat: Resident; not uncommon in suitable habitat; affects freshwater deep jheels, tanks and swamps; behaves more or less like the cormorant; an expert diver and a speedy swimmer, while swimming it sticks out its long neck out of water like the periscope of submarine, which it twists and bends with snake-like movements; a solitary hunter, pursues the quarry, largely fishes, seizing them under water, using its long springing neck and after a successful capture, emerges out of water holding the fish in its bill and flicking the victim up in air to receive it in the widened gape of mouth with the head of the fish down to be swallowed; breeds during rains (July-September); nest rough like that of the crow, erected on trees on the edge of water or on trees standing in water in mixed heronry with cormorants, herons, egrets and other birds; clutch consists of three or four eggs; both sexes share incubation and extend care to the nestlings.

Voice and calls: A harsh, disyllabic croak.

GREY HERON

10. *Ardea cinerea rectristris* Gould

1843. *Ardea rectirostris* Gould, Proc zool. Soc. Lond.: 22. Type-locality: India.

Local names: Kabut (Gujarati); Nāri, Sain, Kābūd, Ānjān (Hindi).

Recognition: A large, long-legged, long-necked, ashy grey waterbird; size that of the Openbill Stork (length 980 mm). Sexes alike.

Crown white bordered laterally with black; crest bears two or three long narrow black feathers during breeding period; a spotted line down centre of the throat; upper plumage ashy grey; wings rounded, primaries slaty black, underparts white; breast white with a large black patch sides; tail short, blue-green.

Iris golden yellow; bill, legs and feet orange-yellow (breeding); bill dark-brown, legs and feet greenish brown (non-breeding).

Distribution: Oriental, found all over the Indian region including the arid and semi-arid tracts of northwestern India. The European Grey Heron (*Ardea cinerea cinerea cinerea*), a palaearctic form, migrates to Kutch and Saurashtra in winter.

Habits and habitat: Resident, not uncommon in suitable wetland; affects reservoirs, lakes, marshes, ponds, and estuaries; solitary, found either at the margin of water or perched on trees or in low bushes, reeds and on decaying logs at the margin or in water; crepuscular, either broods motionlessly by the side of water or stealthy stalking in shallow water; hunts by darting its long, compressed, spear-pointed bill when the quarry appears within range; food comprises mainly fish, also small mammals, birds, water-snakes; frogs and tadpoles, aquatic arthropods and molluscs; flight flappy but strong, its rounded wings labour hard to take off and gain momentum but once it gains speed, attains height in no time with its neck retracted and legs held horizontal behind; breeds in rainy season (July-October); nests gregariously in heronry in company with herons, egrets, cormorants, ibises, storks, sometimes exclusively its own colony; nest erected on top branches of high trees, in absence of such tall trees stunted thorny trees as *Acacia* sp., *Prosopis* sp., become alternative sites; both the sexes take part in nest building; nests made of sticks and twigs, thinly lined with leaves and straw; clutch composes three or four eggs; both the sexes incubate and take care of chicks; incubation period 25-26 days.

Voice and calls: A loud harsh 'frank' uttered on wings.

PURPLE HERON

11. *Ardea purpurea manilensis* Meyen

1834. *Ardea purpurea* var. *manilensis* Meyen, Nova Acta Acad. Caes. Leop. Carol. 16, suppl: 102-103. Type-locality: Philippines.

Local names: Nādi (Gujarati), Nāri, Lāl sāin, Lāl-ānjān (Hindi).

Recognition: A smaller, darker and lankier bird than the Grey Heron; size that of the vulture (length 970 mm). Sexes alike.

Crown and crest slaty black, neck long snake-like, rufous buff, conspicuously striped with chestnut-brown, black and white; upperparts slaty with purplish shade; scapulars attenuated and streaked chestnut; wings and tail slaty-grey; chin and throat white; breast bears plumes streaked with chestnut, underparts slatyblack and chestnut.

Iris yellow; orbital skin greenish or yellow; bill greenish yellow or dark brown, tip horny brown; legs and feet chocolate-brown.

Distribution: Oriental, found throughout India including the wet-land in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; infrequently met with in reedy swamps, marshes, lakes and reservoirs; keeps to tall reed-beds like bitterns; secretive; largely crepuscular, hunts early mornings and late evenings in the manner of the Grey Heron; food comprises fishes, tadpoles and frogs, aquatic insects, shrimps and crabs; breeds in summer through monsoon to autumn (April to October); nests made either in tall reed-beds or in trees standing in or near water built in colonies but are set quite apart, clutch comprises three to five eggs.

Voice and calls: A loud harsh note 'Quarrk' as it takes off.

LARGE EGRET

12. *Ardea alba modesta* J.E. Gray

1831. *Ardea alba modesta* J.E. Gray, *zool. misc.* 19. Type-locality: India.

Local names: Moto Sāfed bāglo (Gujarati); Mālāng baglā, Tūrrā baglā, Tar bāglā (Hindi).

Recognition: A large snow-white bird with black legs and feet, and ornamental white lace-like plumes on back during breeding season, size that of the Grey Heron (length 910 mm). Sexes alike.

Whole plumage white; crown-feathers slightly elongated.

Iris yellow; orbital skin yellowish green, bill black with yellow base; legs and feet yellowish brown.

Distribution: Oriental, found throughout the Indian subcontinent including the wetlands in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Usually solitary; not uncommon in marshes, jhcels, tanks, estuaries,

fishes by still-hunting by day, at times stalks slowly through shallow water and waits motionlessly and patiently for the quarry to approach within its striking range; food comprises mainly fish but also appropriates other small vertebrates, aquatic arthropods; breeds in rainy season (July-september); nest in colonies in heronry with other egrets and herons; nest made of twigs, nest-platforms erected in trees, like Peepul, Tamarix and thorny *Acacia* (Babul), generally situated at the edge of water or nearby; both sexes participate in nest-building, share incubation and extend care to the chicks, incubation period 24-25 days.

Voice and calls: An occasional throaty croak

LITTLE GREEN BITTERN

13. *Ardeola striatus chloriceps* (Bonaparte)

1857. *Ardea chloriceps* 'Hodgs' = Bonaparte, *Consp. Gen. Av.*, 2:129. Type-locality: restricted to Nepal, Hithura, Chisapani Garhi district.

Local names: Lili bāgli (Gujarati), Kānchā bāglā (Hindi).

Recognition: A metallic darkgreen miniature heron with long creast on head; size that of the Pond Heron (length 460 mm). Sexes alike

Head grey, crown black; long occipital crest black, washed with dark green, upperparts blackish grey glossed with bronze green; scapular-feathers slaty grey, long and lanceolate; wing-coverts glossy green; primaries black; cheeks, chin and throat white; underparts ashy grey; under tail-coverts white; tail mixed black and grey.

Iris lemon-yellow; facial-skin yellowish green; bill, upper mandible dark horny brown or black; lower mandible sage-green; legs and feet yellowish green

Distribution: Oriental, found throughout the Indian subcontinent in suitable wetland pockets including those of the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, uncommon; silent and scretive; crepuscular; affects shady thick vegetation growing at the margin of water of village ponds, lakes, reservoirs, marshes and swamps; food comprises fish, tadpoles and frogs, shrimps, crabs, aquatic insects; breeds in summer and during rainy season (April to September); nest-platform made of twigs erected on low trees near water or among thick bushes at the edge of water; clutch consists of three to five eggs; both sexes share incubation and feed the young.

Voice and calls: Utters alarming notes 'Tewn-tewn-tewn' on flight when disturbed.

POND HERON

14. *Ardeola grayii grayii* (Sykes)

1832. *Ardea Grayii* Sykes, *Proc. zool. Soc. Lond.*: 158. Type-locality: Dukhun (= Deccan), Peninsular India.

Local names: Kāni bāgli (Gujarati), Bāglā, Āndhā bāglā, Chāmā bāglā; Kūnch bāglā (Hindi).

Recognition: A small squat brown-white waterbird, slightly smaller than the Cattle Egret (length 500 mm). Sexes alike.

Winter plumage (non-breeding): Head and neck dark brown, striped with light brown; crown dark buff; chin and throat white; upperparts ashy brown; breast white, streaked with brown; underparts white.

(Breeding): Crown brown; occipital crest white of long pointed feathers; head and neck light brown; mantle deep brown to maroon; feathers of back slaty, long and hair-like; breast feathers long, disintrigated ashy brown, streaked with white; wings white, primaries tinged brownish, lower back, tail and rump white.

Iris bright lemon-yellow; orbital skin greenish yellow; bill greenish yellow, bluish at the base; legs and feet dull green.

Distribution: Oriental, found throughout the Indian subcontinent including the wetlands in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; very common, solitary or in loose parties; roosts in trees in the day time, gregarious while roosting; affects freshwater as well as brackish, associates with any small accumulation of water like puddles, ponds, open drain, tank, river, estuaries and backwater; waits patiently and remains motionless on mud and or in shallows, head sunken back when underway within shoulders; moves very slowly with cautious and meticulous steps; hunts by sudden strike by its pointed bill, outstretching the neck to an incredible length; food comprises fish, tadpoles, frogs, aquatic as well as terrestrial insects and arthropods as shrimps, crabs, spiders, etc., also molluscs; breeds in May-september; nests in colonies of its own, sometimes gregarious with other herons, egrets, cormorants and other waterbirds; clutch composes three to five eggs; both sexes take part in nest construction and share incubation period about 24 days; both the parents take care of the chicks and fledglings.

Voice and calls: A harsh croak emitted when disturbed, continuously utters 'wa-koo-wa-koo' and short croaks while nesting.

CATTLE EGRET

15. *Bulbulcus ibis coromandus* (Boddaert)

1783. *Cancroma coromanda* Boddaert, *Table Pl. enlum.*: 54. Type-locality: Coromandel (= Eastern Coast), South India.

Local names: Dhor bāglo (Gujarati); Sūrkhia bāglā, bdāmi bāglā, Doriā bāglā, Gāi bāglā (Hindi).

Recognition: A slender, long-necked and long-legged miniature heron-like white bird, mostly associated with cattle; size that of the village hen (length 510 mm). Sexes alike.

(Non-breeding): Upper and lower plumage white all over; bill yellow; legs black,

(Breeding): Crown, neck and back assume orange or cinnamon long feathers (nuptial plumes); bill orange-yellow, tipped red; legs and feet reddish or yellowish.

Distribution: Oriental, found throughout the Indian subcontinent including arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, quite common, tame and confiding; affects farms, cultivated tracts, pastures, wetland; associates with domestic as well as wild cattle, sheep flock, also follows furrows during ploughing; keeps in small and large parties up to two dozens or more, roosts in trees, sharing with crows, mynas, kites and vultures, and waterbirds; behaves as the Little Egret while foraging in marshland; food comprises insects, mostly grasshoppers, flies, aquatic organisms in mud and slush, sometimes relieves the cattle of ticks, often enjoys a free ride on them; breeds in rainy season (June-September); a colonial breeder, nests gregariously also with other waterbirds in trees; nest-made of sticks, placed preferably on high branches; clutch consists of four or five eggs; both sexes share in nest-building, incubation and extend care of chicks and fledglings.

Voice and calls: Silent except during nesting period when birds call to each other uttering a low croak.

SMALLER EGRET

16. *Egretta intermedia intermedia* (Wagler)

1829. *Ardea intermedia* Wagler, *Isis von Oken*. col. 659. Type-locality: Java.

Local names: Būlā (Gujarati); Pātāṅkhābāglā, Pātokhābāglā, Kārchīā bāglā (Hindi).

Recognition: A snow-white egret; slightly smaller than the Large Egret (length 660 mm). Sexes alike.

In breeding season, breast and back develop long and lanceolate decomposed filaments; crest absent.

Iris lemon yellow; bill black (breeding), yellow (non-breeding) infraorbital skin yellowish green (breeding); yellowish (non-breeding); legs and feet dusky black.

Distribution: Oriental, widely distributed from India to Philippines, China and Japan in the east and Malayasia in the south. Found throughout India including the wetlands in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, shifts with favourable water conditions; fairly common, more social than the Large Egret; parties of a dozen or two often met with; affects marshes, lakes, heels, flooded fields and tidal creeks; food comprises aquatic as well as terrestrial insects, crustaceans, fish and frogs; breeds in summer and in monsoon (June-October); community nesting with other waterbirds as herons, egrets, storks and cormorants; crow-like nest made of sticks and twigs erected in trees, usually on babool (*Acacia* spp.), standing in water; clutch

consists of three or four eggs; both sexes take part in nest-building, incubation and of chicks; incubation period varies from 21 to 23 days.

Voice and calls: A long drawn call 'Krraa-karr' emitted in flight.

LITTLE EGRET

17. *Egretta garzetta garzetta* (Linnaeus)

1766. *Ardes Garzetta* Linnaeus, *Syst. Nat.*, ed. 12, 1:237. Type-locality: Northeastern Italy.

Local names: Kilichio (Gujarati); Kilchiā, Kārchīā-bāglā (Hindi).

Recognition: A miniature heron-like snow-white, slender bird; size that of the village hen (length 630 mm). Sexes alike.

Breeding birds bear two long attenuated feathers; breast feathers develop long lanceolate ornamental plumes; back feathers also become elongated and decomposed turning upwards at the terminal ends.

Non-breeding birds all white without ornamental feathers.

Iris yellow; bill black; facial skin greenish yellow; legs long, black; toes and tarsus base yellow.

Distribution: Southern palaeartic, ethiopian and oriental. Found throughout the Indian subcontinent including the wetlands in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, locally shifting from one area to another depending on the availability of water patch; keeps in small flocks of four to a dozen; roosts in trees or on ground; flight slow, laboured, continuous wingbeats in flight, with head retracted to the shoulders and legs outstretched beyond tail; affects paddy or other cereal fields, marshes tanks, creeks and estuaries; forages by wading in water or stalks on mudflats and flooded cultivated fields; food comprises fish, tadpoles, frogs, aquatic and terrestrial insects, crustaceans and molluscs; breeds with the commencement of rains (July-September); a colonial breeder; nests in heronry in trees with other species of egrets, bitterns, herons, ibises; nests made of sticks erected in tree standing in or at the margin of water, sometimes quite far away. Mostly trees like Tamarisk, Babool (*Acacia* spp.), Khejri (*Prosopis* spp.) preferred; clutch consists of three to five eggs; both the sexes take part in nest-construction, incubation and care of chicks; incubation period variable, usually 21 days but sometimes may be extended to 25 days.

Voice and calls: Usually silent.

NIGHT HERON

18. *Nycticorax nycticorax nycticorax* (Linnaeus)

1758. *Ardea Nycticorax* Linnaeus *Syst. Nat.*, ed. 10, 1:42. Type-locality: Southern Europe.

Local name: Awāāk, wāāk (Gujarati); Wāāk, Kwāāk; Tār bāglā Kōkrāi (Hindi)

Recognition: Like the Pond Heron but with a stouter bill; heavier and darker; largely nocturnal; size that of the Cattle Egret (length 580 mm). Sexes alike.

Crown to back black, with a metallic green wash; occipital crest black, a few ribbon feathers arise from the crest; white on the face, forehead, spread over the eye and cheeks; wings; sides of the body, rump and tail light ashy grey with pinkish gloss; underparts white.

Distribution: Palaearctic, ethiopian and oriental. Found throughout the Indian subcontinent including the water patches in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, locally shifting depending on water level; common in marshy areas; gregarious, shy and secretive; crepuscular and nocturnal, concealing during the day among dense foilage of trees or bushes; affects jheels, lakes, river banks, estuaries; with dusk it starts moving out of their roosts in small parties dispersing to a wide area to forage in shallows of water; food comprises fish and tadpoles, crustaceans, insects and other arthropods; breeds in summer and rainy season (June-September); nests in bushes or trees standing in water or at margins; colonial nesting sharing with other waterbirds as herons, egrets, cormorants, storks and ibises; prefers to nest on uppermost and outermost branches of trees; nest a filmy structure of sticks; clutch consists of four or five eggs; both sexes share in nest-building, incubation and care of the chicks; incubation period, 21 days.

Voice and calls: Harsh-sounding call-quacks 'wock' uttered at intervals.

BITTERN

19. *Botaurus stellaris sellaris* (Linnaeus)

1758. *Ardea stellaris* Linnaeus, *Syst. Nat.* ed. 10, 1:144. Type-locality: Sweden.

Local names: Pārdeshi Pān Bāglā (Gujarati); Nirgoug, Bāz (Hindi).

Recognition: A mottled brown, heavy looking waterbird with an upright stance, neck and bill stretched upwards, size that of the Smaller Egret (length 710 mm). Sexes alike.

Crown and nape black, extending to upper back; crest bushy drooping, a black stripe below eyes; upper back buffy brown, streaked, barred and mottled with dark-brown and black; chin and throat white with a prominent central buff and black line running from chin to breast; underparts yellowish buff heavily streaked and mottled with broken bars of buff and brown; tail short, barred with black.

Iris yellow; bill greenish yellow; facial skin green; legs and feet pale green.

Distribution: Palaearctic, Winters in India including the perennial waters in the arid and semi-arid of northwestern India.

Habits and habitat: Migratory; uncommon; found solitary, very secretive, unless forced out of its hide from tall and dense reed beds where it normally resorts during the day; flight heavy, noiseless but swift, moves short distance to settle again in reed-bushes; crepuscular and nocturnal; forages in marshes, motionless to strike on any moving small creature moving within its striking range; the stroke of its short, stout, pointed bill with lightning speed helps it to fatally stab the prey for its capture; food comprises fish, frogs, lizards, insects.

Voice and calls: Silent in winter.

PAINTED STORK

20. *Mycteria leucocephalus* (Pennant).

1769. *Tantulus leucocephalus* Pennant, *Indian zool.* 11: pl. 10. Type-locality: Ceylon (= Sri Lanka).

Local names: Dhōnk (Gujarati); Chitrōdā (Kutch); Jānghil, Dhōk (Hindi).

Recognition: A colourful, large, long-legged stork having a long heavy and slightly curved bill; size that of the vulture (length 1000 mm). Sexes alike.

Head and neck white; upper plumage white, barred and marked with greenish black; front of the head bare, painted with orange-yellow; feathers about the shoulders and wings rosepink, wing-coverts striped, mixed with greenish black; breast bears a broad black band glossed with green across; belly white; tail black banded with white.

Iris pale yellow; bill yellow; legs and feet brown.

Distribution: Oriental, found throughout the Indian subcontinent including the arid and semi-arid tracts in northwestern India wherever suitable water areas available.

Habits and habitat: Resident; quite common in wet areas; keeps in parties, large and small, sometimes solitary; affects jheels, flooded fields and marshes; plods mud and stalks in shallows with the bill submerged and partially open to collect aquatic creatures; food comprises fish, frogs, crabs and other crustaceans, and insets; perches and roosts in trees; a strong flier, takes to wings with a series of wing strokes and short glides, sailing in circles with wings outspread; breeds in rainy season (July to September); nests in colonies, nests made of large sticks erected to form a platform lined with leaves and straw. Generally top of tall trees standing in water preferred as nesting sites. Mixed colonies of egrets, herons, cormorant, and other storks normally selected but solitary nest also seen; clutch consists of two or three eggs; both sexes incubate and extend care to the chicks.

Voice and calls: Voiceless but produces loud castanetlike clattering of the mandibles, specially during the breeding season.

OPENBILL STORK

21. *Anastomus oscitans* (Boddaert)

1783. *Ardea oscitans* Boddaert *Table Pl. enlum.*: 55. Type-locality: Pondicherry, India.

Local names: Gugālā (Gujarati); Gūnglā, Ghūngil, Ghonghilā (Hindi).

Recognition: A small pied stork with long legs and toes and a curious gap between the mandibles; size that of a large duck (length 810 mm). Sexes alike.

The smallest of the storks; upperparts white flight feathers and tail black; underparts white.

Iris pale brown; bill dull greenish with a faint red-wash on the lower mandible; orbital and bare facial skin black; legs and feet pale fleshy.

Distribution: Oriental. Found throughout the Indian subcontinent including the wet areas in arid and semiarid tracts of northwestern India.

Habits and habitat: Resident; not common; keeps singly or in small flocks; affects inland tanks, ponds irrigated fields as well as estuarine flats; a strong flier, takes to wings quickly to soar high up in the sky with other soaring birds; roosts in trees; wades in water with partially submerged bill to collect food material; food comprises largely molluscs (gastropods), crabs, frogs, fishes; breeds in July-September; courting dance prior to pairing performed with clattering noise with its beak; breeds in colonies, gregarious nesting with other waterbirds aswing-coverts striped, mixed with greenish black; breast bears a broad black band glossed with green across; belly white; tail black banded with white.

Iris pale yellow; bill yellow; legs and feet brown.

Distribution: Oriental, found throughout the Indian subcontinent including the arid and semi-arid tracts in northwestern India wherever suitable water areas available.

Habits and habitat: Resident; quite common in wet areas; keeps in parties, large and small, sometimes solitary; affects jheels, flooded fields and marshes; plods mud and stalks in shallows with the bill submerged and partially open to collect aquatic creatures; food comprises fish, frogs, crabs and other crustaceans, and insets; perches and roosts in trees; a strong flier, takes to wings with a series of wing strokes and short glides, sailing in circles with wings outspread; breeds in rainy season (July to September); nests in colonies, nests made of large sticks erected to form a platform lined with leaves and straw. Generally top of tall trees standing in water preferred as nesting sites. Mixed colonies of egrets, herons, cormorant, and other storks normally selected but solitary nest also seen; clutch consists of two or three eggs, both sexes incubate and extend care to the chicks.

Voice and calls: Voiceless but produces loud castanetlike clattering of the mandibles, specially during the breeding season.

WHITENECKED STORK

22. *Ciconia episcopus episcopus* (Boddaert)

1783. *Ardea episcopus* Boddaert, *Table Pl. enlum*: 54. Type-locality: Coromandel Coast, (Eastern Ghats, India).

Local names: Kāli-tṭl (Gujarati); Lāglāg (Hindi).

Recognition: A white necked, glossy black stork with a long, stout, pointed bill; size that of a large goose stalled on long legs (length 920 mm, height 1060 mm). Sexes alike.

Crown black with a green gloss, rest of the head white; neck, lower abdomen, under wing-coverts white; upper plumage black glossed with purple to bluish-green; wing and tail short, tail black.

Iris brown, facial skin plumbeous; bill black, tinged with red; legs red.

Distribution: Ethiopian and oriental. The nominate subspecies ranges throughout the Indian subcontinent including the marshes existing in the arid and semi-arid tracts of northwestern India.

Habits and habitat : Resident; not uncommon; keeps singly or in pairs in irrigated fields and small marsh patches; sedentary; a good flier, soars at great height; food comprises fish, frogs, tadpoles, reptiles, arthropods. Breeds during rainy season (July-October); nests in large trees, nest a large shallow saucer made of twigs and small branches lined with straw, dry grass and feathers; both the sexes take part in nest construction; clutch consists of three or four eggs; incubation largely done by the female, occasionally by the male; care of chicks being taken by both the parents.

Voice and calls: Clattering of mandibles, produced to greet each other on perches, otherwise silent.

WHITE STORK

23. *Ciconia ciconia ciconia* (Linnaeus)

1758. *Ardea Ciconia* Linnaeus, *Syst. Nat.*, ed. 10, 1:141. Type-locality: Sweden.

Local names: Ujāli (Gujarati); Lāglāg, Hāji lāglāg, Ujli, Dhak, Gybār, Bādā rētwā (Hindi).

Recognition: A tall white stork, with a long neck, almost like the egret, a heavy pointed bill and plumage pattern that of the Openbill Stork; size that of the vulture (height 1060 mm, to the top of its head). Sexes alike, male larger.

Upper plumage white; feathers of head, neck and breast long and lanceolate; greater wing-coverts, primaries and secondaries black; underparts white.

Iris bluish grey to brown; bill, legs and feet vermilion.

Distribution: Southwestern palaeartic, migrates south and east of its breeding range. Found in drier parts of India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Winter visitor (October-March); uncommon but a regular visitor; keeps in small flocks, in pairs or singly, affects wet grassland, moist ploughed cultivated tracts and semi-dry pasture land in proximity of water; wary; flight falapping followed by gliding, quite fast and strong; roosts at night on tops of trees but in the absence of trees may rest on land; movement on land leisurely foraging at edges of tanks or estuaries, riverbanks; food comprises large insects, specially grasshoppers, locusts, hoppers, also fish, frogs, lizards and rodents or small-sized mammals.

Voice and calls: No call note except sound produced by clattering of mandibles.

BLACK STORK

24. *Ciconia nigra* (Linnaeus)

1758. *Ardea nigra* Linnaeus, *Syst. Nat.*, ed. 10, 1:142. Type-locality: Sweden.

Local names: Kālō Dhōnk (Gujarati); Surmāl (Hindi).

Recognition: A black and white stork; size that of the vulture but on long legs (length 900 mm, height 1060 mm). Sexes alike.

Head black glossed with copper-red; mantle black glossed with purple and green; underpart white.

Iris brown; bill scarlet; legs and feet crimson.

Distribution: Palaearctic, winters in northern and northwestern India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: A migratory species; keeps solitary or in pairs, sometimes associates with the White Stork; quite wary; affects marshes in and around open water; feeds largely on fishes, frogs, lizards and snakes, arthropods, aquatic as well as terrestrial.

Voice and calls: Silent in winter in India.

BLACKNECKED STORK.

25. *Ephippiorhynchus asiaticus asiaticus* (Latham)

1790. *Mycteria asiatica* Latham, *Index Orn.*, 2:670. Type-locality: India.

Local names: Bānārās (Gujarati); Bānārās, Lohārjāng, Lohā Sārāng (Hindi).

Recorded from Gajner (4 birds), Bikaner District, Pokhran (2 birds), Jaisalmer District, Ganganagar (Single bird), Ganganagar District, in November - January 1959-1960 (A.K.M.).

Recognition: A large pied stork with a very heavy bill and long legs. In flight white underwings show black line across each wing; size that of the vulture (height 1200 mm). Sexes alike.

Head and neck black washed with bluish green; nape bears a patch of coppery brown; upper plumage including the tail black, glossed with metallic green; back and upper tail-coverts white; under plumage white.

Iris bluish brown; bill black; bare skin of gular pouch and eyelids dusky purple; legs and feet coral-red.

Distribution: Oriental, found throughout the Indian region including the arid and semi-arid tracts of northwestern India where it sporadically occurs.

Habits and habitat: Resident, less gregarious, usually keeps in pairs, sometimes found solitary; perches on trees or rests on ground with tarsi flat on the ground; forages at edges of pools, jheels and marshes, saltwater lagoons and also wades in water; food comprises fishes, frogs, reptiles, molluscs, crabs and insects; flight heavy and slow but once air-borne sails fast; breeds from October to January; pairs intending to court approach each other and stand face to face then after fluttering their wings meet their head and produce clattering sound by striking their mandibles; nests large platforms of sticks and small branches with slight depression in the middle, lined with grass, water weeds, and feathers, erected on branches of tall trees; clutch consists of three to five eggs; both the sexes share incubation and extend care to the chicks.

Voice and calls: A few grunts emitted during breeding season and during courting period clapping of the bill continues.

WHITE IBIS

26. *Threskiornis aethiopica melanocephala* (Latham)

1790. *Tantalus melanocephalus* Latham, *Index Orn.* 2:709. Type-locality: India.

Local names: Dholi-kānkānāsār (Gujarati); Mūnda, Sāfēd Bāzā, Didhār (Hindi).

Recognition: A bare-headed, black-necked waterbird, with a curlew like bill; size that of a large domestic hen (length 770 mm). Sexes alike.

In non-breeding birds head and neck bluish black; upper and lower plumage white; tips of primary feathers mottled with brown and feathers of shoulder (scapulars) slaty-grey.

Breeding birds attain elongated and loose feathers around neck and on shoulder; upper breast bears plume like feathers, under wing-coverts turn blood-red.

Iris reddish brown; bill and legs black.

Distribution: Oriental, widespread throughout the Indian subcontinent including the wetland

in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; fairly common; more of a marsh bird; affects coastal belt and inland jheels; found in pairs and parties; perches in trees or wades in water for foraging, also along the edge of water; food comprises molluscs, crustaceans, aquatic insects; flight slow with rapid wing-beats and short glides forming a single file or in 'V' formation; breeds from July to September; nests in mixed heronry in trees standing in water or on edges of water tank with hanging branches over water; nest a large platform made of sticks and twigs erected on upper branches; both the sexes take part in nest-building; clutch consists of two to four eggs incubation period 23-24 days shared by both the sexes.

Voice and calls: Silent except in breeding season when booming and grunts produced.

BLACK IBIS

27. *Pseudibis papillosa papillosa* (Temminck)

1824. *Ibis papillosa* Temminck, *Pl. col.* 51: pl. 304. Type-locality: India.

Local names: Kāli-Kānkānsār (Gujarati); Bāzā, Kālā-Bāzā, Kārān Kṛl (Hindi).

Recognition: A large black waterbird with a slender down-curved bill; size that of the domestic hen (length 680 mm). Sexes alike.

Head bare covered with black skin, crown bears a triangular red patch, consisting of very small warts; shoulders bear conspicuous white patch; upper plumage steel-blue-black; lower plumage black.

Iris orange-red or brown; bill bluish grey; legs and feet coral-red.

Distribution: Throughout the drier plains of the Indian sub-continent including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; common; keeps in pairs or small parties up to a dozen; affects drier margins of lakes, water pools, seashores, open fields, often found near refuse dumps; roosts in large trees, soars in circles during the day; forages in fields and margins of water; food comprises fish, frogs, lizards, worms, arthropods, grains and rubbish; breeds between March and September; nest-platform made of stick and straw erected high up in large trees; clutch composes two or three eggs, sometimes four; both the sexes incubate and tend care to chicks.

Voice and calls: Two or three loud screaming notes uttered while on wings; very noisy during the breeding period.

GLOSSY IBIS

28. *Plegadis falcinellus falcinellus* (Linnaeus)

1766. *Tantalus Falcinellus* Linnaeus, *Syst. Nat.*, ed. 12:241. Type-locality: Austria and Italy.

Local names: Pān-Kānkānāsār (Gujarati); Kāwāri, Kowar, Chhōta-Bāzā (Hindi).

Recognition: A blackish ibis very similar to the Black Ibis with a slender down-curved bill and feathered head; size more or less that of the domestic hen (length 520 mm).

Head black glossed with green and purple; upper plumage chestnut-brown glossed with bluish green; underparts chestnut; under tail-coverts and axillaries deep purple; legs long; toes long and slender. Sexes alike.

Distribution: Discontinuously palaeartic, ethiopian and oriental. In the Indian subcontinent, sporadic. Found in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Nomadic, largely a winter visitor; uncommon; gregarious; keeps in flocks up to a dozen or two; perches and roosts in trees; affects shallow mudwater, flats of shores and rivers, jheels; forages extensively in soft mud by probing its long bill into soft mud like the curlew extracting aquatic organisms from underneath; food comprises aquatic and terrestrial insects, crustaceans, worms, molluscs, tadpoles and fish; flight quite fast and moves in flocks forming 'V' in wavy ribbons.

Voice and calls: Silent in winter.

SPOONBILL

29. *Platalea leucorodia major* Temminck & Schlegel.

1849. *Platalea major* Temminck & Schlegel, In *Siebold Fauna Jap.*, Aves: 119, pl. 73. Type-locality: Japan.

Local names: Chāmchō (Gujarati); Chāmāch-bāzā, Chāmchā (Hindi).

Recognition: A tall snow-white bird with a long, broad spatulate bill; size that of the Night Heron (length 840 mm; height 600 mm). Sexes alike.

Adult during breeding season bears a crest of drooping plumes and an orange tawny patch on the foreneck and upper breast; bare facial skin sulphur yellow and throat reddish yellow.

Iris blood-red; bill black to slaty grey, tipped yellow; legs and feet black.

Distribution: Palaeartic, ethiopian and oriental. Found more or less throughout the wet area of India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, not uncommon in suitable wet-habitat; keeps in small flocks, sometimes, congregates in large numbers; affects large swamps and marshes, perennial tanks, lakes and river banks, also tidal creeks; perches on trees, standing in or near water; on flight move in 'V' formation with well stretched legs and neck; flocks forage in muddy edges of water or in shallows sweeping their bill from side to side scything the muddy water and raking the mud with its lower bill; food comprises largely aquatic plants and insects, also fish, frogs,

molluscs, etc. Breeding season follows monsoon (August-November); nests in colonies built in large trees; nest a large platform made of sticks and twigs, shallow in the middle erected by both the sexes; clutch consists of four or five eggs; incubation period about three weeks, both sexes take part in incubation.

Voice and calls: Silent, except during breeding time when short low grunts and bill-clattering are produced.

LARGE FLAMINGO 30. *Phoenicopterus roseus* (Pallas)

1811. *Phoenicopterus roseus* Pallas, *Zoogr. Russo-Asiat* 2:207. Type-locality: Mouth of the River Volga, southern Russia.

Local names: Bālō, Huj (Gujarati); Boghāns, Rajhāns (Hindi).

Recognition: A tall rosy-pink and white bird with an unique bill abruptly bent down in the middle of a slender long snake-like neck; size, more or less of a goose (height 1400 mm). Sexes alike.

Upper plumage white; upper and under wing-coverts pink; axillaries pink, innermost secondaries rose-pink; flight-quills black; legs long and bare, feet completely webbed.

Iris yellow; bill pink with black tip; legs and feet deep pink.

Distribution: Ethiopian, palaearctic and oriental, In India largely found in desert areas. In northwestern Indian plains and also shores, sporadic in other parts of India.

Habits and habitat: Resident, also locally migratory and dispersing; fairly common, gregarious, congregates in large numbers affecting sea-coast, lagoons, inland brackish water lakes and freshwater reservoirs and lakes; wades into shallow water, when at rest usually supports itself on one leg with neck coiled round, head rests on the back; flight strong and fairly fast, in flight neck and legs fully extended, and form 'V' or wavy ribbon; forages in shallows with long neck bent down with its head immersed in water, feeding with bill inverted, taking mud scraped from the bottom, squeezing and straining it out through comb-like fringes in the mandibles, sieving the food-material with its complicated filter of its bill and tongue; food comprises tiny molluscs, crustaceans specially brine shrimps, aquatic insect larvae, occasionally fish-fry, algae, halophytic plants and mud including grit: breeds gregariously in the expanse of the Great Rann of Kutch during the monsoon (July-October). sometimes in March-April; nest long blunt conical heap or mound of salt mud raised 250 to 400 mm above the water level with a shallow depression on top; clutch consists of a single, unusually two eggs; both the sexes incubate and extend care to the chicks.

Voice and calls: While foraging produces a constant babble 'gag-gag,' also utters 'ghonk-ghonk'

*Found the Flamingo congregation in Sambhar Lake, Rajasthan in the year 1957 (6000+), 1958 (5000+) and 1960 (8000+) birds in numbers (average) which arrived during November, December and January months, and left by early February. A. K. M)

LESSER FLAMINGO
31. *Phoeniconaias minor* (Geoffroy)

1798. *Phoenicopterus minor* Geoffroy, *Bull. Soc. Phol.* Paris, 1:98. Type-locality: East Africa.

Local names: Nāno-bālo or Nāno-hunj (Gujarati); Chōtā-rājhāns (Hindi).

Recognition: A diminutive form of the Large Flamingo; size almost that of the duck (height 1050 mm). Sexes alike, female slightly smaller and paler.

Upper plumage bright rose-pink; wing-coverts bright scarlet (breeding), duller (non-breeding); base of the bill feathered crimson; neck thicker than the large Flamingo; upper mandible lies between the rami of the lower mandible.

Iris red; bill dark carmine-red or reddish brown with light bands across and tipped black; legs and feet red.

Distribution: Ethiopian Oriental. Range from Africa, through west Asia to northwestern India, including Kutch, Gujarat and Rajasthan.

Habits and habitat: Migratory, movement irregular in India, arrives in summer as well as in winter; affects coastal belt, lagoons, brackish lakes; foraging habits like that of the Large Flamingo; food comprises largely blue algae and diatoms, minute insect larvae and crustaceans; nests infrequently in the Great Rann; nesting-habits similar to the Large Flamingo.

Voice and calls: Short parrot-like call and also 'gag-gag' and 'ghonk-ghonk'

EASTERN GREYLAG GOOSE
32. *Anser anser rubrirostris* Swinhoe.

1871. *Anser cinereus* var. *rubrirostris* Swinhoe, *Proc. zool. Soc. Lond.* 416. Type-locality: Shanghai (China)

Local names: Gāj Hāmsā (Gujarati); Gāj (Kutch); Sonā, Karriā-sonā; Hāns, Rājhāns (Hindi).

Recognition: Like farmyard goose with a dark brown heavy head, a stout bill and pink legs: Size that of a large duck (length 810 mm). Sexes alike.

Upper plumage french-grey mixed with brown; forewing and rump pale grey; head, neck and breast greyish brown; underparts whitish with some blackish spots; outer feathers of tail white, central brown, tipped white; base of the bill rimmed with white feathers.

* Observed large flocks of Lesser Flamingo in Sambhar Lake, Rajasthan in March, July and January during 1957-1960, accompanying flocks of the large Flamingo. (A.K.M.)

Iris brown; bill pink, nail at tip of the upper mandible white; legs and feet pink to purple.

Distribution: Palaearctic, winters in Upper India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, winter visitor; rather uncommon; gregarious, congregates to form large flocks; affects lakes, salt marshes, cultivated tracts, wet meadows; extremely wary; swims buoyantly diving like a duck; flight swift and strong; it easily rises from the ground flying in 'V' formation maintaining even space between members, generally old bird acts as the leader; forages along the edges of water during the day and feeds mostly by grazing in the night in crop fields; food comprises vegetables like grass seed, grain, aquatic weeds and tubers.

Voice and calls: A loud, sonorous call 'gag-gag-gag' or honks 'aahug-ung-ung' uttered in different keys.

BARHEADED GOOSE 33. *Anser indicus* (Latham)

1790. *Anas indicus* Latham, *Index Orn.* 2:839. Type-locality: Taimyr (India).

Local names: Rājḥāmsa (Gujarati); Hāns, Kāreyee-hāns, Rāj-hāns, Birwā, Sāwān (Hindi).

Recognition: More or less like the Graylag Goose but slender; bears distinctive two dark bars on the back of the head; smaller than the Greylag Goose (Length 750 mm). Sexes alike.

Head and sides of the neck white with a pair of black bars on the nape; upper plumage pale ashy-grey, feathers of upper back and shoulders paler tipped; greater-coverts broadly edged with white; primaries black; tail pale grey, edged with white; forehead and breast brown shading to light brown; underparts white.

Iris dark brown; bill orange-red or yellow, nail at the tip black; legs and feet yellow.

Distribution: Palaearctic, breeds in Tibet and Ladakh (Kashmir), winters in the plains of India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory; not uncommon in Rajasthan but rare elsewhere in the arid region; gregarious; flocks and a dozen to several dozens congregate in open expanses of large waters; forages at night in crops and cultivation, flight straight from ground with sustained wing-beat forming a 'V'

Voice and calls: A deep sonorous gaggling chorus of all party members.

LESSER WHISTLING TEAL 34. *Dendrocygna javanica* (Horsfield)

1821. *Anas javanica* Horsfield, *Trans. Linn. Soc. Lond.* 13:199, pl. 1. Type-locality: Java.

Local names: Nāni-sisoti (Gujarati); Chayi (Kutch); Seelhi, Seelkātri (Hindi); Chayi (Kutch).

Recognition: A small brown, long-necked, long-legged duck with an upright stance; size that of the domestic duck (length 420 mm). Sexes alike.

Crown dark brown with a black line down the back of the nape; chin and throat white; upper plumage dark brown; feathers pale rufous tipped, wings black; shoulders bear chestnut patch; a buff patch on the sides of the body; lesser wing-coverts and upper tail-coverts chestnut; tail dark brown and short; underparts pale ferruginous, darker on abdomen; under tail-feathers whitish; legs well adapted for perching.

Iris brown; bill brownish blue; legs and feet dark brown.

Distribution: Oriental, found, more or less throughout the Indian subcontinent including the wetland in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, also local migrant; fairly common; keeps in pairs or small flocks; flight comparatively slow and flapping; a good swimmer and an expert diver; readily alights on tree to perch; forages in shallow water, food comprises fish, tadpoles, aquatic insects, worms and vegetable matter; breeds during rainy season (July-September); nests in hollows of trees or on fork of branches, sometimes on the ground among reeds on shores of lakes and pools, nest-made of twigs and leaves; clutch consists of 8-12 eggs; both the sexes incubate, incubation period about 25 days, care of chicks done by both the parents.

Voice and calls: Emits a shrill whistling note 'sea-sick' specially on flight.

BRAHMINY DUCK 35. *Tadorna ferruginea* (Pallas)

1764. *Anas (ferruginea)* Pallas, In *Vroeg. Cat. Ois., Adumbr.* 5. Type-locality: Tartary, U.S.S.R.

Local names: Brāhmāni-bātāk, Sṛkhāb (Gujarati); Chākwā (male), Chākwi (female), Sṛkhāb, Lāl (Hindi).

Recognition: A buffy-brown, large goose-like duck with a pale head and white patch on wing coverts; size that of the large domestic duck (length 660 mm).

Head and neck buffy-white; upper plumage orange-brown; wings whitish-buff, flight-feathers black, wing bears a metallic speculum (on both sides) with a white patch; tail black.

Male in breeding season develops a narrow black collar, round the base of the neck; in female black collar absent, head paler and whitish and in general duller all over.

Iris brown or dark brown; bill black; legs and feet black.

Distribution: Palearctic, migrates south of its breeding range, winters in the Indian subcontinent including the arid and semi-arid tracts of northwestern India.

Habits and habitats: Migratory, winter visitor; keeps in pair on edges of water; affects large open jheels, lakes, reservoirs, sandbanks and sandy islets, sea coast and salt marshes; quite wary; swims well and walks on land with ease; most part of the day it rests, becomes active at night foraging in nearby cultivation and also feeds in aquatic vegetation; food comprises grain, shoots, tubers, wild grass-seeds, aquatic insects, crustaceans and molluscs.

Voice and calls: A harsh call 'karr-karr' uttered in flight, when on land emits a loud 'chakwa aunga' warning note by the male, reciprocated by the female by a different note 'chavkwi no ao'

COMMON SHELDUCK 36. *Tadorna tadorna* (Linnaeus)

1758. *Anas Tadorna* Linnaeus, *Syst. Nat.*, ed. 10, 1:122. Type-locality: Sweden.

Local names: Sāfed-sūrkhāb (Gujarati); Shāh-chākwā, Rārāriā (Hindi).

Recognition: A large duck, much goose-like, with highly contrasting coloured plumage and upturned bill and a large fleshy knob; size that of the domestic duck (length 610 mm), female smaller.

Drake: Head and neck greenish black; upper plumage white banded with chestnut across forepart of the body; a bright green speculum; scapulars, primaries and tip of tail black; breast white mixed with chestnut; underparts white.

Duck: Duller with chestnut feathers on breast edged with black; base of the bill and knob white.

Iris brown; bill coral-red, knob red; legs and feet fleshy red.

Distribution: Palearctic, migrates south of its breeding range, winters in India including northwestern India.

Habits and habitat: Migratory, uncommon winter visitor; irregular and sporadic; keeps in small parties; affects brackish as well as freshwater lakes, tanks and perennial water stretches; keeps more to edges or islets in water; forages in wild vegetation, less so in cultivated crop; food comprises, insects, worms, crustaceans, snails, fish and vegetable matter which includes much of wild seeds.

Voice and calls: Usually silent in winter.

PINTAIL 37. *Anas acuta* Linnaeus

1758. *Anas acuta* Linnaeus, *Syst. Nat.*, ed. 10, 1:126. Type-locality: Sweden.

Local names: Singpār (Gujarati), Sand, Seenkhpār (Hindi), Dhrūgūchho (Kutch).

Recognition: A slender duck with a long neck and pointed tail, and a graceful carriage; size, smaller than the domestic duck (length 560-740 mm), female slightly smaller.

Drake: Head and foreneck chocolate; hind neck black; a conspicuous white band runs from side of the chocolate head and neck to fuse with white nape and breast; upper plumage finely barred and vermiculated with black and white; sides of the body also vermiculated like the back; underparts white; wings brown, longer scapulars lanceolate in shape; speculum dull bronze green with a copper-coloured bar in front; flanks vermiculated with slaty grey; under tail coverts black with a broad yellowish patch on either sides of the base of tail; two long central tail-feathers pointed.

Duck: Greyish brown above; crown dark brown; back faintly streaked and barred; chin and throat white; wing greyish brown; speculum inconspicuous set between two bars; tail pointed but short and barred with black; lowerparts buffy white.

Iris dark brown, bill bluish plumbeous; legs and feet plumbeous grey.

Distribution: Palaearctic, winters south of its breeding range. Found more or less throughout the Indian subcontinent including the arid tracts of northwestern India.

Habits and habitat: Migratory, winter visitor; keeps in flocks of 10 to 30 individuals, sometimes in larger numbers; parties exclusively of males common; affects fresh and brackish waters containing adequate reed cover and aquatic vegetation; wild and wary, flocks keep fairly to open water, well out of shooting range, occupying the middle of the jheel; very swift on wings; flocks produce low hissing swiss of the wing; swims well, floating lightly on water; walks with ease in fields, marshes and slush.

Voice and calls: Silent during winter.

COMMON TEAL

38. *Anas crecca crecca* Linnaeus.

1758. *Anas Crecca* Linnaeus, *Syst. Nat.* ed. 10, 1:126. Type-locality: Sweden.

Local names: Nāni Bātāk (Gujarati); Chhoti murghābi, Kerrā, Lohiyā Kerrā, Chowtee, Patāri, Souchurukā (Hindi).

Recognition: A very small duck with a metallic green and black speculum; size a little bigger than the Cotton Teal (length 380 mm).

Male (adult): Head and neck cinnamon, a broad metallic green band edged with buff line enclosing eye, running down the sides of the neck; chin blackish brown; wings brown; wing-bar tri-coloured, black, green and buff; upperparts and sides of the body white sharply waved with black; scapulars white; rump brown; patch at the sides of the tail buffy brown; breast white, spotted with black; abdomen white. In the eclipse plumage, head like that of the female; crown

and nape dark brown; body feathers and scapulars edged with rufous buff.

Female: Upper plumage dark brown mottled and streaked with dusky brown; lower neck and breast cinnamon mottled with black and brown; underparts buff; speculum green.

Iris dark brown; bill dark slaty-grey; legs and feet greenish grey.

Distribution: Palaearctic, winters south of its breeding range. Found throughout the Indian subcontinent including the arid tracts of the northwestern India.

Habits and habitat: Migratory, a winter visitor; very common; flocks in large numbers to marshes, shallows, jheel, pools and ponds that harbour adequate aquatic vegetation; forms 'V' on flight; flight very swift, strong and agile with much turns and twists; an expert swimmer; a surface feeder, food comprises mostly aquatic vegetation as well as cultivated grain and tender shoot.

Voice and calls: A low-toned 'krit' call by the male responded by a high-pitched 'quack' by the female.

SPOTBILL DUCK

39. *Anas poecilorhyncha poecilorhyncha* J.R. Forster

1781. *Anas poecilorhyncha* J.R. Forster, *Indian Zool.*:23, pl. 13, f.1. Type-locality: Ceylon = Sri Lanka.

Local names: Gugrāl (Gujarati); Gārm pāi, Gugrāl (Hindi).

Recognition: A large clumsy duck with scaly pattern, and two red spots at the base of the bill, size that of the domestic duck (length 610 mm). Sexes alike.

Head and neck whitish, crown blackish brown; a buff band through the eye; upper plumage dusky brown, feathers broadly edged with grey; lower back, rump and upper tail-coverts brownish black; wings brown, wing-bars metallic green edged with black and margined with white; breast buffy, spotted with brown; abdomen pale to dark brown.

Iris brown; bill black, tipped yellow and base spotted with orange or coral red; legs and feet orange-red.

Distribution: Throughout the Indian subcontinent including the arid tracts of the northwestern India.

Habits and habitat: Resident and locally migratory; fairly common; keeps in pairs or in small parties of six to a dozen; affects freshwater lakes, also saline water in inland, marshes and wet cultivated fields; forages among weedy, submerged aquatic vegetation, affects mostly marginal reeds in shallows; food comprises aquatic insects, worms, molluscs, etc., breeds during rainy season from July to October; nest made of grass, rush, weeds and feathers forming a pad, concealed among reeds and other herbage on the margin of water or on small islets; clutch consists of half to a dozen eggs; the duck incubates mostly, incubation period 24 days.

Voice and calls: A quack emitted from time to time.

MALLARD

40. *Anas platyrhynchos* Linnaeus

1758. *Anas platyrhynchos* Linnaeus, *Syst. Nat.*, ed. 10, 1:125. Type-locality: Sweden.

Local names: Nēēlsī r (Gujarati); But, Raje ((Kutch); Nī l Sir, Nī r-rugi (Hindi).

Recognition: A large buffy duck with purple blue speculum and two black curled feathers above the tail; size that of the domestic duck (length 610 mm).

Drake (adult) Head emerald green; neck with a narrow white collar; upper breast deep chocolate; upper plumage brown, finely vermiculated; wing-coverts chestnut; the blue wing-speculum bordered in front and behind by narrow white and black bands; scapulars grey, also vermiculated; abdomen finely vermiculated with grey; rump and upper tail-coverts black.

Duck (adult): Upper plumage dark brown; crown buff; underparts pale brown; breast and abdomen streaked; wings and speculum as in the drake.

Iris brown; bill greenish yellow (male), greenish olive (female); legs and feet orange-yellow.

Distribution: Palearctic, winters south of its breeding range. Found in Upper India including the arid tracts of the northwestern India.

Habits and habitat: Migratory, a winter visitor; infrequently met with; keeps in small parties consisting of a dozen or so; affects reedy patches; wary, with least suspicion takes to wings rising straight from water; a surface-feeder; food comprises brackish as well as freshwater vegetables as shoots, seeds, corms also animal matter as worms, crustaceans, insects, molluscs, fish and tadpoles.

Voice and calls: Drake emits a low whispering note, duck emits a loud 'quack'

GADWALL

41. *Anas strepera strepera* Linnaeus

1758. *Anas strepera* Linnaeus, *Syst. Nat.*, ed. 10, 1:125. Type-locality: Sweden.

Local names: Chetvā (Gujarati); Mylā, Bhuār, Beykhur (Hindi).

Recognition: Very similar to the Mallard in gait but dull-coloured with black and white speculum; size, more or less of the domestic duck (length 510 mm).

Drake (adult): Forehead and crown creamy golden; upper plumage blackish; rump and upper tail-coverts black; wing coverts chestnut; wings in flight appear more pointed than that of the mallard, and a white patch on the wing conspicuous; upper breast blackish; underparts whitish.

Duck (adult): Like the Mallard upper plumage dark brown mottled with buff and tinged with rufous; wing bears a white patch, greater wing-coverts largely black; underparts white.

Iris brown; bill leaden grey; legs and feet dusky orange.

Habits and habitat: Migratory, a winter visitor; quite common, sometimes found in large numbers flocking to marsh and tanks; floats lightly on the water surface, rises quickly at ease in air, flies fast gaining height in very short time; food comprises aquatic shoots, weeds, wild and cultivated seeds, also worms, insects and molluscs, etc.

Voice and calls: Very like those of the Mallard, chuckling croaks and quacks.

WIGEON

42. *Anas penelope* Linnaeus

1758. *Anas penelope* Linnaeus, *Syst. Nat.*, ed. 10, 1:126. Type-locality: Sweden.

Local names: Piyesānā (Gujarati); Peāsān, Pātāri, Phāriā, Chhotā Lālsir (Hindi).

Recognition: More or less like the Common Teal but slightly larger, with a short and narrow bill and narrow wings (length 490 mm).

Drake (adult): Forehead buffy white, rest of the head and neck chestnut; upper plumage and sides finely vermiculated with black; wing-coverts bear white patch; speculum metal green bordered with black; tail-coverts black; upper breast buffy pink; abdomen white.

Duck (adult): Altogether brown, lightly suffused with reddish brown; breast pale brown, spotted; white on the wing-covert lacking, white edges of greater wing-coverts and terraries present; speculum green; abdomen white.

Distribution: Palaearctic, winters south of its transpalearctic breeding area to the temperate and tropics. Winter in the Indian subcontinent including the arid tracts of the northwest.

Habits and habitat: Migratory, a winter visitor; gregarious, flocks in large numbers to freshwater marshes; flocks move in irregular lines producing rustling noise; prefers shallow water supporting adequate aquatic vegetation; very swift on wings, with least alarm flocks take off straight from water and with agility twist, turn and swerve to avoid gun shots; a surface feeder, also grazes at edges of tanks and in crop fields; food comprises shoots of aquatic plants, cultivated and wild seeds, occasionally insects, molluscs, etc.

Voice and calls: Drake produces a distinct loud musical whistling note 'whee-oo' duck utters a purring growl.

GARGANEY

43. *Anas querquedula* Linnaeus.

1758. *Anas querquedula* Linnaeus, *Syst. Nat.*, ed. 10, 1:126. Type-locality: Sweden.

Local names: Kardio, Chetrā (Gujarati); Chāitā, Khirā, Pātāri (Hindi).

Recognition: Much like the Cotton Teal but slightly larger (length 410 mm).

Drake (adult): Head and neck chestnut-brown finely streaked with brown-white; a broad and long white band extending from eye to nape; wing-coverts pale blue conspicuous in flight; speculum bronze-green bordered with two white bands; scapulars elongated and glossy-black with a broad central white stripe; breast buffy brown; abdomen white sharply demarcated from breast.

Duck (adult): Crown dark brown; eyes bordered above and below with prominent white bars; sides of head and neck white streaked with dark brown; speculum faint olive-green; upper plumage dark brown; throat pure white; underparts buffy white, mottled on chest and sides with brown.

Iris dull brown; bill dull black, a whitish spot at the base; legs and feet grey or lead-grey or black.

Distribution: Palaearctic, winters south of its breeding range. In the Indian subcontinent more common in the northwest including the arid tracts.

Habits and habitat: Migratory, a regular winter visitor; arrives as early as September and the last to leave in April; common but not abundant; gregarious; affects lakes, jheels, tanks and other fresh and brackish water specially shallow parts of water bordered by thick vegetation; a surface feeder, also walks about in marshland and cultivated fields; food comprises aquatic plants, tender shoots, wild and cultivated seeds, also aquatic insects, worms, molluscs, etc.

Voice and calls: Usually silent. Drake at times produces sound of battering of hollow sticks; duck a 'quack'

SHOVELLER

44. *Anas clypeata* Linnaeus

1758. *Anas clypeata* Linnaeus, *Syst. Nat.* ed. 10, 1:124. Type-locality: South Sweden.

Local names: Pāgtichānch, Gāino (Gujarati); Tidāri, Punānā, Tokarwālā, Ghirāh (Hindi) Phatphaje (Kutch).

Recognition: A heavy spatulate beaked duck; size somewhat smaller than the Mallard (length 510 mm).

Drake (adult): Head and upper neck glossy purplish green; hind neck and back dark brown; wing-coverts blue-grey; greater wing-coverts tipped white; speculum green; rumps and upper tail-coverts black glossed with green; tail dark brown edged with white; upper breast white; scapulars elongated with white shaft-bands streaked blue-grey and black; lower breast

and abdomen chestnut; under tail-coverts black.

Duck (adult): Like the female Mallard, mottled dark and light brown; feathers fringed paler; scapulars greyish brown; speculum dull green; wings greyish-blue; breast pale chestnut brown; abdomen chestnut brown.

Iris yellow (male), brown (female); bill long and flat, twice as broad at the tip as at the base; colour of the bill black or dark brown with bright orange base; legs and feet orange-red.

Distribution: Holarctic, breeds throughout transpalearctic and nearctic regions in the northern hemisphere, migrates to temperate and tropical regions south of its breeding range. In the Indian subcontinent, more common in North and West India.

Habits and habitat: Migratory, a winter visitor; common but not abundant; keeps singly or in pairs, sometimes in small parties; very confiding; not very expert in diving and swimming, rises from water heavily but once on wings it flies strongly; affects shallow fresh water pools with muddy bottom, slushy and muddy banks supporting luxuriant vegetation, also village tanks and cultivated fields; gobbles at the edge of water and strains out food particles from mud and muddy water; food comprises aquatic seeds, wild and cultivated grain and large amount of animal matter as fish, frog, molluscs, crustaceans, aquatic insects.

Voice and calls: Silent, occasionally utters a croaking 'quack'

REDCREASTED POCHARD 45. *Netta rufina* (Pallas)

1773. *Anas ruina* Pallas, *Reise Russ. Reicha*, 2:713. Type-locality: Caspian sea.

Local names: Ratobari, Lāl-Chāñch (Gujarati); Lāl-Chouch, Lālsir (Hindi).

Recognition: A shorter bodied dark stocky diving duck with a golden head; size that of the Mallard (length 540 mm).

Drake (adult): Head golden orange, crest chestnut-red forms a roundish bushy ball; upper plumage light brown and white; wings brown, breast glossy black; flanks white.

Duck (adult): Much smaller than the drake; upper plumage khaki grey; crown dusky; cheeks and throat pale white; flanks with large white patches.

Iris red (male), reddish brown (female); bill bright pinkish red with a white tip (male), reddish brown (female); legs and feet red (male); orange-brown (female).

Distribution: Southern Palearctic, migrates south of its breeding range. In the Indian subcontinent more common in North and West India including the arid tracts.

Habits and habitat: Migratory, a winter visitor; not common in the waters in arid tracts; keeps in small flocks of half a dozen to a dozen; shy and wary; rapid flier, takes off with slight alarm rising from the water with ease; affects larger open waters; collects food by diving to

reach the bottom mud and weeds, also forages on edges of tanks; food comprises aquatic vegetables, shoots, seeds, grass, also aquatic insects, molluscs, fishfry and tadpoles.

Voice and calls: Silent in winter.

COMMON POCHARD
46. *Aythya ferina* (Linnaeus)

1758. *Anas ferina* Linnaeus, *Syst. Nat.*, ed. 10, 1:126. Type-locality: Sweden.

Local names: Tārāndio, Lāl-Sir (Gujarati); Burārñār, Lāl-Sir (Hindi).

Recognition: A squat, heavy-built, grey-black pochard, with a broadly lobed hind toe, size that of a domestic duck (length 480 mm).

Drake (adult): Head and neck dull chestnut-red; upper back, breast and rump glossy black; lower back vermiculated grey; wing bears a light grey speculum; upper tail-coverts black; lower breast and abdomen greyish white; under tail-coverts black.

Duck (adult): Head, neck and breast dark brown; crown black; cheeks and throat greyish-white; mantle, breast and wing coverts dull brown, faintly vermiculated; lower breast and abdomen whitish to greyish brown; flanks and under tail-coverts brown.

Iris reddish-yellow; bill bluish grey, tipped black; legs slaty grey, feet black.

Distribution: Central palaeartic, winters south of its breeding range. In the Indian subcontinent more common in the northern and western India, including the arid tract.

Habits and habitat: Migratory, a regular winter visitor, very common, gregarious; affects small shallow ponds, tanks, lakes and jheels bordered by thick vegetation; an expert swimmer and a diver; takes off with great effort from water but once in the air flies straight and strongly; obtains food by diving in shallows to collect submerged vegetation and aquatic animal matter—food comprises shoot, leaves, seeds, and corm as well as aquatic insects, crustaceans, molluscs and small fishes, and tadpoles.

Voice and calls: A harsh croak 'kirr-kirr' or 'kurr-kurr'

WHITE-EYED POCHARD
47. *Aythya nyroca* (Guldenstadt)

1770. *Anas nyroca* Guldenstadt, *Novi. Comm. Sci. Petropol.*, 14:463. Type-locality: South Russia.

Local names: Tamni, Dholi-ānkh, Karchiyā (Gujarati); Kurchiyā, Burār mādā, Mājithā (Hindi).

Recognition: A small plump reddish brown duck of the size of the Common Teal (length 410 mm).

Drake (adult): Head, neck and breast dark rich chestnut-red; a blackish brown collar round the lower neck; mantle, wings and tail black, chestnut breast sharply demarcated from the white abdomen; under plumage white; wing-speculum and inner webs of primaries white forming roughly a crescentic band, very conspicuous in flight; flanks reddish brown.

Duck (adult): Head, neck, breast, upper mantle dull reddish brown; upper plumage brown; rump black; wing-speculum white; inner webs of primaries mouse-grey and form a crescentic band; breast reddish brown mixed with white; breast not sharply demarcated from the white abdomen.

Iris white (drake); brown (duck); **bill** slaty grey; **legs** plumbeous grey and **feet** blackish.

Distribution: Southern and central palaeartic, migrates south of its breeding range. Winters in India including the northwestern arid tracts.

Habits and habitat: Migratory, winter visitor; not abundant; keeps in pairs or in small parties of a dozen or two; affects fresh and brackish water pools, ponds, swamps, also sea coasts; prefers more secluded and weedy waters; an expert swimmer and a diver; food comprises mostly aquatic vegetation as shoots, seeds, corms, tender leaves, also molluscs, crustaceans and aquatic insects, fish and tadpoles.

Voice and calls: Harsh call 'kak-kak-kak' like that of the Common Pochard.

TUFTED DUCK

48. *Aythya fuligula* (Linnaeus)

1758. *Anas fuligula* Linnaeus, *Syst. Nat.*, ed. 10, 1:128. Type-locality: Sweden.

Local names: Kākwelio, Chotili Kābāri Bātāk (Gujarati); Dubāru, Ablāk, Rahwārā (Hindi).

Recognition: A small black and white duck with a long recumbent crest; size more or less of the Gadwall (length 430).

Drake (adult): Head and neck black glossed with purple; crest black; upper plumage dark blackish brown; wing speculum white; breast dark brown; under plumage white to light brown; flanks white.

Duck (adult): Black of the male replaced by dark brown; white wing patch smaller; under plumage dirty white or sootier.

Iris yellow to golden yellow; **bill** grey; **legs** and **feet** slaty.

Distribution: Palaeartic, migrates south of its breeding range wintering in India including the northwestern arid tracts.

Habits and habitat: Migratory, arrives as early as September and departs by April, quite

common in winter; an expert diver, taxis on water surface for a long distance to take off and once air borne flies swiftly ; affects shallow water, pools with reeds, occasionally sea coasts, food comprises aquatic vegetation also animal food as aquatic insects, crustaceans, molluscs, also fish and tadpole.

Voice and calls: Generally keeps silent, sometimes emits harsh calls 'kur-r-r-kur-r-r' on wings.

COTTON TEAL

49. *Nettapus coromandelianus coromandelianus* (Gmelin)

1789. *Anas coromandelianus* Gmelin, *Syst. Nat.* ed. 13, 1(2):522. Type-locality: Coromandel, India.

Local names: Girijā (Gujarati); Girri, Girriā, Girjā (Hindi).

Recognition: A pygmy goose with largely white feathers; size that of the Rock Pigeon (length 330 mm).

Drake (adult): Head glossy greenish black; sides of the head, upper back and under plumage white; a black ring around base of the neck and upper back; mantle glossy greenish black with purple reflections; upper tail-coverts dark brown barred with white; wing-coverts dark green, basal half of the primaries dark brown, a white wing-bar; tips of primaries black.

Duck (adult): Crown brown; eyebrow and the rest of the head, neck and under plumage dirty white; a long dark brown stripe through the eye; black collar absent; upperparts, wings and tail brown; lacks wing-bar; wing quills tipped with white; upper tail-coverts light greyish brown.

Iris reddish brown (male), brown (female); bill, upper mandible dark olive, lower mandible yellow; legs and feet, blackish brown.

Distribution: Oriental, represented by the nominate subspecies in the Indian subcontinent including suitable wet localities in the arid tracts of the northwestern India.

Habits and habitat: Resident as well as locally migratory; not common; keep in parties or in small flocks; affect marshes, small and large patches of water, lakes and jheels containing much vegetation; an expert swimmer and a diver; flies fast with rapid wing beats but low over water with manoeuvring twists and turns to avoid obstructions of vegetation stumps; food comprises aquatic plant shoots tender leaves, wild and cultivated seeds, also animal matter; mainly worms, aquatic insects, crustaceans, molluscs, fish and tadpole; breeds during monsoon between July and September; nests in holes and hollows of trees near water, nesting holes, thinly lined with grass, twigs, feathers and rubbish; clutch consists of six to a dozen eggs; female incubates, incubation period, about 15 days.

Voice and calls: Emits chuckling notes on flight.

COMB DUCK

50. *Sarkidiornis melanotos melanotos* (Pennat)

1769. *Anser melanotos* Pennant, *Ind. Zool.*, 12 pl. 11. Type-locality: Ceylon = Sri Lanka.

Local names: Nāktā (Gujarati); Nāktā (Hindi).

Recognition: An enlarged edition of the Cotton Teal with a comb on the bill of the drake; size that of a large goose (length 760 mm) (male), (650 mm, female).

Drake (adult): Head and neck white, densely to lightly spotted and speckled with black; lower neck collared, mantle, wing and tail brilliantly glossed with metallic green, purple and bronze; bill bears an upstanding black fleshy comb at the base; under plumage white; under tail-coverts orange-yellow (breeding), white (non-breeding).

Duck (adult): Similar to the male in colour pattern but smaller and less glossy; bill without a comb.

Iris dark brown; bill black; legs and feet greenish plumbeous.

Distribution: Ethiopian-Oriental, the nominate subspecies found throughout the Indian subcontinent including suitable localities in the arid northwest India.

Habits and habitat: Resident and local migrant; rather uncommon; keeps in pairs or small family parties, five to ten in numbers; affects ponds, marshes, tanks and jheels that have a few trees at edges and in surroundings; flight heavy, strong and swift, also walks with ease; essentially a tree-duck, perches on branches roosting at night; feeds by grazing at water edge and also in nearby cultivated fields; food comprises wild and cultivated seeds, shoots and tubers of water plants, also aquatic insects and worms, fishes, tadpoles, etc.; breeds from July to September depending on the commencement of rains; drake polygamous, courtship display consists of arching of head and neck and raising the feathers of the crown, neck and body by the drake, also reciprocated by the duck; pairing takes place in water; nests in natural holes and hollows of trees; nest practically unlined, clutch consists of normally 6-14 eggs, sometimes upto 20; incubation period 30 days, the female only incubates.

Voice and calls: A low grunting sometimes a harsh croak.

BLACKWINGED KITE

51. *Elanus caeruleus vociferus* (Latham)

1790. *Falco vociferus* Latham, *Index Orn.* 1:46. Type-locality: India = Coromandel Coast.

Local names: Kāpāsi (Gujarati); Kāpāssi, Māsūnwā (Hindi).

Recognition: Small, stocky, grey and white, black-winged; size more or less of the House Crow (length 330 mm). Sexes alike.

Upperparts ashy grey, a patch of white on forehead and a black line above each eye; bill

small, broad at base, sharply curved; underparts pure white; tail white, square wings dark grey, tipped black, long and pointed, extending beyond tail when closed, legs short and stout, partially feathered provided with sharp claws.

Iris red faintly streaked with black; bill black, cere yellow; legs and feet orange; claws black.

Distribution: Throughout India but patchily distributed, including Rajasthan, Kutch, Saurashtra and Gujarat.

Habits and habitat: Resident, not uncommon in suitable habitat in tropical light forests cultivated plains and grass savannahs, more in semi-arid tracts; usually met with singly or in parts, roosting at night on preferred trees in large numbers; activities resume in early morning and late evening hours; flight graceful, slow with deliberate wing beat, flies low often hovering where prey is indicated, plumps down on its quarry; food comprises insects, specially termites and ants on wings, small reptiles, rodents and other small terrestrial animals, breeds in summer and rainy season (May to September); nest made of stick and twigs much crow-like pattern on branches of low trees or shrubby bushes. Both the sexes take part in nest building; clutch composes three or four eggs, both the partners share incubation and extend care to chicks,

Voice and calls: Usually keeps silent, occasionally utters a very high-pitched squeal.

KITE

52. *Milvus milvus milvus* (Linnaeus)

1758. *Falco milvus* Linnaeus, *Syst. Nat.* ed. 10, 1:89. Type-locality: South Sweden.

Local names: Belāyṭi Sāmāli (Gujarati).

Recognition: A rusty brown deeply fork-tailed kite; size that of the Pariah Kite (Length 610 mm). Sexes alike.

Head light brown, upper plumage rufous brown; breast rusty red streaked with dark brown abdomen pale rufous; tail bright rufous; tips of primaries blackish brown.

Iris amber yellow, bill black, cere yellow; legs and feet yellow.

Distribution: West and southwest palaearctic, recorded as vagrant in the Rann of Kutch and Gujarat.

Habits and habitat: Rare; migratory? (vagrant); affects lightly wooded semi-desert, salt desert and rocky coasts bearing scattered vegetation with sparse trees; feeds on live terrestrial small animals and also on carrion and garbage, often proves a nuisance to man for stealing poultry, fish from fish-haul and marauding in meat, fish and poultry markets.

PARIAH KITE

53. *Milvus migrans govinda* Sykes.

1832. *Milvus Govinda* Sykes, *Proc. Comm. Zool. Soc. London*, 81. Type-locality: Dukhun (= Deccan), South India.

Local names: Sāmāli, Cheel (Gujarati); Cheel, Cheeloriā (Hindi).

Recognition: A large brown bird of prey, dingy in appearance, with a long markedly forked tail, most noticeable on the wing; size somewhat smaller than the vulture (length 610 mm); Sexes alike.

Upper plumage chocolate brown, lower paler; head flat, a dark patch behinds the eye; body plumage marked with dark shaft-stripes; wings long, pointed, flight-feathers blackish; tail brown above, light brown to white below with cross bars; legs short, partly feathered.

Distribution: Throughout India including arid and semi-arid tracts of Punjab, Haryana, Rajasthan, Kutch, Saurashtra and North Gujarat.

Habits and habitat: Resident, common; keeps in loose parties sometimes sallying in large numbers over places of interest where food is available; affects generally human habitation, specially near about slaughter houses, fish markets as well as sea-board and countryside; glides gracefully in the air with long leisurely strokes and soars in circles overhead; a commensal of man, being omnivorous, scavenges all refuse-meat, fish and poultry scraps, dead animals or any other food stuff; sudden derring-do swoop despoils food stuff from people's hold imparting a shock to the looser; also hunts poultry chicks, locusts, gryllids, termites, beetles on wings; roosts in trees in large numbers on fixed roost, also on building tops; breeding commences with the fall of autumn through winter to spring; nest an untidy platform of sticks and twigs lined with rubbish, erected by both the partners on a fork of a tree, high from the ground; clutch consists of two or three eggs; incubation shared by both the partners and care extended by them to the chicks and fledglings.

Voice and calls: A long drawn characteristic whinnying call 'ewe-ewe-wir-wir-wir...' uttered on wings as well as on perch.

BLACKEARED KITE

54. *Milvus migrans lineatus* (Gray)

1831. *Haliaeetus lineatus* J.E. Gray, in *Hardwicke Ill. Indian Zool.* 1(8): pl. 18. Type-locality: China.

Local names: Kāshmiri Cheel, Shialu Somāli (Gujarati); Cheel, Okāāb Cheel (Hindi).

Recognition: Alike the Pariah Kite but distinguishable in flight by a conspicuous white underwing patch at the base of the primaries and in being larger; size slightly larger than the Pariah Kite (length 660 mm). Sexes alike.

Darker than the Pariah Kite; upper parts tawny; back blackish; ear-coverts black and conspicuous; tail less deeply forked; underparts paler.

Iris brown; bill black, cere greenish yellow; legs and feet yellowish white or almost white.

Distribution: Palaearctic, winters in India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory; sedentary; not uncommon in winter; affects sea-coast, also inland wet areas, more attached to sea-fishermen's huts; other habits that of the Pariah Kite.

Voice and calls: A shrill call 'Chewe-chir-chir-chir'

BRAHMINY KITE
55. *Haliastur indus indus* (Boddaert)
(Plate V, Fig. 19)

1783. *Falco Indus* Boddaert, *Table Pl. enlum*: 25. Type-locality: Pondicherry, South India.

Local names: Brāhmāni Cheel (Gujarati); Brahmini Cheel, Sānkar Cheel, Dhobiā Cheel, Roo-mubārāk (Hindi),

Recognition: A white and chestnut-coloured bird of prey; size, smaller than the Pariah Kite (length 480 mm), Sexes alike.

Head, neck and breast white; bill large, compressed and sharply hooked; upperparts, wings and tail bright chestnut; wings long, flight-feathers blackish; tail moderately long, rounded, tipped whitish; abdomen light chestnut; body plumage bears dark shaft-lines; tarsus short and feathered above.

Iris brown, bill bluish-horny, cere yellowish; legs and feet dull greenish yellow.

Distribution: Oriental, found throughout India, including the wetland of the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, common; keeps singly; affects inland wet-areas, lakes, tanks, riversides, fresh water and tidal marshes, also sea-coasts; habits combine that of the Pariah Kite and the Harrier; a carnivorous bird, sea-side population scavenges in sea-ports and feeds on offal like the Pariah Kite, inland dwellers hunt in the manner of a harrier hunting terrestrial as well as aquatic animals; food comprises fish, frogs, shrimps, crabs from drying puddles and pools specially when men get busy in collecting fishes, also adds small land animals, sick and wounded birds and poultry; breeds during winter and spring (December-April); nest-made of sticks and twigs, much crow-like installed high up in trees; both sexes take part in nest-building; clutch comprises two or three eggs; incubation period 26-27 days, incubation and tending of chicks shared by both the partners.

Voice and calls: Emits horse whistle 'ewe-wir-wir'

GOSHAWK

56. *Accipiter gentilis schvedowi* (Menzbier)

(Plate I, Fig. 3)

1822. *Astur palumbarius schvedowi* Menzbier *Orn. Geogr. Eur. Russl.* 439. Type-locality: Transbaikalia.

Local names: Zurrā (male), Shāhbāz (female) (Gujarati); Zurrā (male), Bāz (female) (Hindi).

Recognition: A large magnificent bird of prey with short and round wings; fanned-tail long and barred, conspicuous in flight; long unfeathered tarsus provided with powerful claws; size that of the Pariah Kite (500-600 mm), female larger; except for the difference in size, sexes alike.

Upperparts grey; forehead white, rest of the head ashy grey; a white supercillium running to the nape; lower chin and throat whitish; underparts whitish barred with greyish black; breast black-shafted; wings cover the base of the tail; under tail-coverts white.

Iris golden yellow to orange-red; bill slaty-grey, cere yellow; legs and feet yellow; claws black.

Distribution: Palaearctic, found in Indian subcontinent including the forested areas in the semi-arid regions in northwestern India (Mt. Abu, Rajasthan): Bhavnagar, (Gujarat); Gajner, Bikaner District, (Rajasthan).

Habits and habitat: A rare winter visitor; sedentary; affects wooded regions, occupies thickly foliated trees; well known for its boldness and hunting ability; hunts at tree-tops as well as on land, moving fast on wings close to the ground to sweep live terrestrial birds, and other small vertebrates and large insects; its powerful talons enable it to lift prey of its own size; hunts generally in early morning and late evening, often seen soaring in circles leisurely at great heights with spread out wings and tail.

Voice and calls: Wintering birds remain silent.

SHIKRA

57. *Accipiter badius dussumieri* (Temminck)

1824. *Falco dussumieri* Temminck, *Pl. col. Livr.* 52, text to pl. 308 (adult) pl. 336 (immature). Type-locality: Bengal, Eastern India.

Local names: Shikri (male), Shikrō (female) (Gujarati); Chipā, Cheepāk (male), Shikrā (female) (Hindi).

Recognition: A small stout grey hawk; size that of the Rock Pigeon (length 310-360 mm).

Male: Upper plumage bluish ashy grey; head roundish, bill short and curved; sides of the

head and neck paler and rufescent; chin whitish with a median grey stripe; wings round, feathers grey and tipped black; tail longish, ashy grey above, underside of tail barred with dark brown except the central and outer pairs; underparts whitish; legs long, slender, bare, feathers up to knee-joint.

Female: Largerr than the male; upper plumage brownish grey closely barred with reddish brown below; central tail-feathers very faintly barred.

Irish orange yellow; bill slaty blue tipped black, cere orange-yellow; legs and feet yellow; claws black.

Distribution: Oriental, found throughout the Indian subcontinent (except the wet zones) including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident as well as a local migrant; fairly common; ;keeps solitary or in pairs; affects light thin forests, well wooded groves and gardens, open country and cultivation; generally avoids treeless desert tracts perches in large trees waiting for the quarry to take it by surprise; food comprises small birds, rodents, lizards, snakes, frogs and large insects; flies at high speed to overtake others; when at leisure rapid wing-flaps with short glides take it high in the sky to soar in circles; breeds from April to June; nest-made of twigs and sticks lined with grass supported on tree forks; clutch consists of three or four eggs; both sexes take part in nest-building, incubation and tending of chicks; incubation period 18 to 21 days.

Voice and calls: Very noisy during the breeding season uttering a sharp double 'tilu-tilu' note all the time.

SPARROW-HAWK

58. *Accipiter nisus nisosimilis* (Tickell)

1833. *Falco Nisosimilis* Tickell, *J. Asiat. Soc. Beng.* 2:571. Type-locality: Marcha, Borabhum = Barabhum, Purulia district, West Bengal.

Local names: Bādsheen (male), Badshāh (female) (Gujarati); Bāshin (male), Bāchā (female), (Hindi).

Recognition: A stout, short-winged, medium-sized hawk; size that of the House Crow (length 310-360 mm).

Male: Almost like the Shikra (*Astur badius*) but darker above, head darkish; a white supercilium present; cheeks, rufous; median grey stripe of the throat absent; underparts whitish barred with black; legs and feet slender and long, middle toe long and thin.

Female: Considerably larger and much heavier than the male; more brown above, paler below.

Iris orange or orange-yellow; bill dark grey, tipped black, cere yellow; legs and feet yellow; claws black.

Distribution: Palaearctic, migrates south of its breeding range. Found throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Winter visitor; uncommon, arrives as early as August and departs by May end; solitary; shy; extremely alert, when suspicious drops all on a sudden from the tree, then flies low, parallel to the ground and shoots up vertically to take refuge in another tree; affects wooded country nearby water, scrub patches, riverine hedges, sea-coasts; roosts in shady trees during the day, hunting in the early morning and late evening hours; very tactical in capturing birds, mainly small passerines among trees and bushes, also quails, partridges and poultry, waders, and occasionally small mammals, also large insects.

Voice and call: Wintering birds generally silent.

LONGLEGGED BUZZARD 59. *Buteo rufinus rufinus* (Cretzschmar)

1826. *Falco rufinus* Cretzschmar, in *Ruppel's Atlas Vog*: 40, 127. Type-locality: Upper Nubia, Schendi and Sennar and Ethiopia = Shendi on Upper Nile.

Local names: Mosāmi Teesō (Gujarati); Chuhāmār (Hindi).

Recognition: A bulky, short-necked, long-legged sluggish bird of prey, easily recognizable in soaring flight by its spread rounded tail, and peculiarly moth-like pattern and crescent-shaped patch in the underwing; size that of the Pariah Kite (length 610 mm). Sexes alike.

General plumage colour very variable, differs in different phase, pale brown, dark brown and several intergradations.

Pale phase: Upper plumage brown, feathers of back and wing-coverts brown with white base, broadly edged with rufous, darker than sides; wing-feathers (quills) tipped dark brown with bases mottled white and brown; tail-feathers pale creamy rufous, grey and white at base, transversely barred with broad subterminal band; lowerparts rufous white or brown; flanks spottled or banded with dark rufous brown.

Dark phase: The whole plumage blackish brown, head more rufous; wing-feathers blackish primaries deeply notched, base of primaries white; tail pale rufous, paler at tip with inconspicuous whitish subterminal bars.

Iris brownish yellow; bill horny or slaty brown tipped black; cere greenish yellow; legs and feet dingy yellow; legs and feet dingy yellow.

Distribution: A palaearctic bird migrating throughout the drier parts of India including the arid tracts of northwestern India.

Habits and habitat: A winter visitor; not uncommon, keeps singly or in pairs; shy; affects light forests and trees near cultivation, in and around villages, prefers drier areas; perches in trees, big mounds or building tops; soars and circles in sky at great heights to locate quarry, descending leisurely with preplans to attack the animal which gets startled by the sudden

approach of the predator; hunts birds as pigeons, quails, partridges, gerbils and other rodents, lizards, snakes and large insects, specially grasshoppers and locusts.

Voice and calls: Generally silent, when excited produces short and sharp high-pitched 'mew'

WHITE-EYED BUZZARD

60. *Butastur teesa*. (Franklin)

1832(1831) *Circus Teesa* Franklin, *Proc. zool. Soc. Lond*, pt. 1:115. Type-locality: Farther India = Ganges-Nerbudda (= Ganga-Narbada).

Local names: Teesō (Gujarati); Tisā (Hindi).

Recognition: A medium-sized, heavy build, brown like the male Harrier with white conspicuous eyes, and black streak on chin and throat; in overhead flight, spread wings appear broad and underside silvery-grey-brown, contrasting with darker body; size that of the Jungle Crow (length 430 mm). Sexes alike.

Upper plumage brown to rufous brown with dark shaft streaks; a white patch on nape conspicuous; wings pointed, black-tipped, wing-patches grey; axillaries bare reddish brown patches; sides of wings mottled or barred with white; tail rounded, rufous brown with narrow blackish bands of which the sub-terminal is the broadest but inconspicuous; chin and throat white with three longitudinal dark stripes; sides of head, neck and breast brown with black shaft-streaks; underside brown barred with buff; undertail-coverts and thighs rufous.

Iris white or pale cream-white; bill yellow; cere orange-yellow; legs and feet dingy orange-yellow; claws black.

Distribution: Oriental, found throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident and locally migratory; fairly common; keeps singly or in pairs; quite sluggish; affects dry open country, scrub and cultivations, light forested areas; perches upright on wayside trees, telegraph posts, mounds, haystacks and low bushes; flight fast and strong, often seen to soar in circles high up, gliding to touch the ground and again fly to a perch; from the perch it pounces upon its quarry to capture with its strong talons from the ground, often walks about on foot; food comprises rodents, lizards, large insects; breeds from February to May; prefers to nest on tall, foliated trees; nests made of loosely arranged sticks and twigs are placed fairly high up on tree forks; both sexes share nest building; clutch consists of two or three eggs; female only incubates.

Voice and calls: Shrill repeated mewing 'tit-tear, tit-tear'

BONELLI'S EAGLE

61. *Hieraaetus fasciatus fasciatus* (Viellot)
(Plate II, Fig. 7)

1822. *Aquila fasciata* Vieillot, *Mem. Soc. Linn. Paris*, 2 (2):152. Type-locality: Montpellier, South France.

Local names: Sunsāgār (Gujarati), Morāngi (Hindi).

Recognition: A lighter or slenderer Hawk-Eagle but without a crest. In flight, wing-tips are slightly upturned; the silvery-white body, pale plumage under the wings with greyish patches and streaks distinctive; size that of the Pariah Kite or slightly larger (length 680-720 mm). Sexes alike, male slightly smaller.

Upper plumage brown above with a white patch on the back; underside rufous buff or white streaked with brown; wings rounded, rather short, bill small, legs feathered, long; tail longer compared with eagles (*Aquila* spp.); grey with a broad distinct subterminal black band; claws very strong and large.

Iris pale golden yellow; bill bluish grey, tipped horny black; cere light yellow; feet yellow, claws brown.

Distribution: Palaearctic and oriental, found in most parts of India including the arid and semi-arid northwestern India.

Habits and habitat: Resident; not uncommon in its typical winter dry and deciduous light forests; it is neither a bird of the open desert nor of deep forest, keeps to forest edges along rivers and rivulets, waterholes in dry country; movement sedentary, generally keeps in pairs; a rapacious bird, an active, daring, strong predator, hunting singly or in pairs adopting tactical methods, with thunderbolt swoop, it captures a wide range of prey including mammals, birds and lizards, animals as large as young gazelle, kids, hare, birds as bustards, partridges, poultry hen, lifting the booty from the ground. Through thick foliage manoeuvre to glide to catch birds on wings, as green pigeons, doves and crows, favourite spots of hunting in the arid areas are waterholes; breeds from March to June; during the breeding time the pair circles round the nesting site, display of arial aerobatics consists of undulating flights, swoops and plunges, rolling and foot-touching with occasional calls are parts of courtship; nests in trees or crevices of precipitous walls of rocks; nest-a massive platform of sticks and twigs with a depression lined with leaves erected high up on tall trees, the same nest used years after years with necessary additions or alterations; clutch consists of a pair of eggs; both sexes share incubation and tend the chicks.

Voice and calls: Usually silent, sometimes emits low-pitched repeated mellow 'klu-klu-klu-klu'

BOOTED HAWK-EAGLE

62. *Hieraaetus pennatus* (Gmelin)
(Plate I, Fig. 1 & 2)

1788. *Falco pennatus* Gmelin, *Syst. Nat.* ed. 13, 1(1):272. Type-locality: Not mentioned = France most likely.

Local names: Pārdeshi Sānsāgār (Gujarati), Bāghāt, Jumiz, gilheri-mār, Choti-morāngi (Hindi).

Recognition: Like the Bonelli's Eagle but stouter and smaller; size that of the Brahminy Kite, female considerably larger (length 500-540). Sexes alike.

Found in two colour phases, Pale and Dark.

Pale phase: Forehead and lores white, head and neck rufous buff, feathers with dark centres; upper plumage buffy-white; flight-feathers blackish; tail brown, obscurely barred with dark brown; underparts white or buff streaked with black on chin and breast.

Dark phase: Upper plumage dark brown; feathers dark shaft-stripped with paler fringes; upper-coverts whitish, tail greyish brown above, paler below; underparts brown streaked with dark brown on breast; a blackish patch on the underwing-coverts.

Bill moderately strong, upper mandible festooned, sharply hooked; tarsus feathered to toes; claws curved, strong and large; claws of the central toes absent.

Iris brown; bill bluish grey, tipped black; cere yellow; feet dull yellow.

Distribution: South palaeartic and oriental regions, found almost throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory; infrequently met with; more of a forest bird, affects forested areas on hills and plains, semi-arid scrub jungles and *Dalbergia* complex, groves and gardens in the vicinity of forests; roosts in well foliated trees from where it plants its attack on the quarry; very powerful and dashing hunter, hunts mostly doves, pigeons, mynas, crows on wings and also terrestrial mammals and birds; a regular poultry raider, seldom fails to capture the quarry once it launches attack.

Voice and calls: Shrill 'kok-kik-kik' repeated from time to time.

IMPERIAL EAGLE 63. *Aquila heliaca heliaca* Savigny (Plate IV, Fig. 13)

1809. *Aquila heliaca* Savigny, *Descr Egypte, Ois*; 82, pl. 12. Type-locality: Upper Egypt.

Local names: Sāhi Jummās (Gujarati); Jumiz. Bādā Jumiz, Satāngā (Hindi).

Recognition: A large dark eagle with a whitish head and neck; size more or less that of a vulture (length 810-900 mm). Sexes alike, Female larger.

Upper plumage brown to reddish-brown; forehead streaked with black; head and cheeks

tawny-buff to whitish; bill large, stout and sharply hooked; wings long and broad, flight feathers blackish brown, white tipped, subterminal band black, underparts blackish brown, feathers buff-edged; legs feathered to the toes, claws curved, strong, sharp and powerful.

Iris hazel; bill bluish horn tipped black; cere yellow; feet yellow to chrome-yellow; claws horny black.

Distribution: Central and West Palaearctic, migrates South to Oriental Region including northern and western India (Rajasthan and Gujarat).

Habits and habitat: A winter migrant; keeps singly; affects flat, low-lying dry plains; usually perches on trees or on mounds on ground; rather sluggish; flight slow and heavy but it takes to wings, soars high wandering about a lot in search of food; food comprises living as well as dead animals. Hunts rodents, hares, small birds specially waders, fishes, largely mud fishes and gobids on mud-flats. Often persuades other hunting birds forcing them to drop their captured prey, also shares carrion with other scavenging birds.

Voice and calls: Silent in non-breeding season.

TAWNY EAGLE

64. *Aquila rapax vindhiana* Franklin (Plate II, Fig. 8 & Plate, III Fig. 9)

1831. *Aquila vindhiana* Franklin, *Proc. zool. Soc. Lond.* pt. 1:114. Type-locality: Vindhya Hills, Central India.

Local names: Desi Jummās (Gujarati); Okāāb, Rāgār (Hindi).

Recognition: A heavy large brown eagle with a flat head, sharp long hooked bill and round tail; size that of the vulture (length 630-710 mm). Sexes alike.

Adult colour variable, plumages appear in different shades as brown, buff, amber-brown and tawny, wings brown; flight-feathers dark blackish-brown barred and mottled with white at the base; tail greyish brown, long cross-banded with blackish and round, much like vulture on overhead flight.

Iris greyish brown; bill bluish grey, tipped black, cere dull yellow; feet light yellow; claws black.

Distribution: Palaearctic, oriental and ethiopian, found throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, locally migrant; quite common; essentially a bird of dry sandy and grassy plains, savannah and cultivation, a great flexibility in climatic adoption, as such the range of distribution extends from the dry desert areas in the west and humid tropics in the east; soars high in the manner of a vulture to sight carcass, from perch dashes out, chasing the quarry fast on its wings, overtaking animals as rodents, hares, sick animals and aquatic and terrestrial birds, lizards, snakes, frogs, mud-skippers, winged insects, etc., like the Imperial Eagle

it has the habit of robbing other falcons and hawks of their booty by chasing them to drop their prey, also feeds on carrion and offal, breeds mostly in winter and spring from November to April, sometimes up to June; courtship like that of the Bonelli's Eagle; nest made of sticks and twigs lined with grass and leaves, erected on tree-tops by both the sexes, generally thorny trees of *Acacia* spp., also large *Ficus* spp., preferred; clutch consists of one to three eggs; both sexes incubate and tend chicks.

Voice and calls: On nuptial play or aggression, high-pitch notes 'shreep-shreep or kowk-kowk' emitted.

GREATER SPOTTED EAGLE

65. *Aquila clanga* Pallas
(Plate II, Fig. 5)

1811. *Aquila clanga* Pallas, *Zoogr. Rosso-Asiat.*, 1:351. Type-locality: Russia and Siberia = Siberia, U.S.S.R.

Local names: Kāl jāngā (Hindi).

Recognition: A large blackish raptore with a black head, sprinkled with white; size that of the kite; Sexes alike, female larger than the male (length 650 mm.).

Upperparts dark blackish brown to chocolate brown, heavily spotted with white specks; upper tail-coverts whitish; underparts streaked with pale rufous. In flight pale bands noticeable on upper sides of wings; subadult plumage confusing - a white crescentic patch above the base of the tail, conspicuous in juvenile.

Distribution: Palaearctic-Oriental; patchily found in well-watered areas in arid and semi-arid tracts of northwestern India (western Rajasthan)* where migratory population often met with.

Habits and habitat: Winter visitor, met with singly observed perched on tree-tops nearby irrigation tanks and jheels; flight sluggish, flies low over the surface of water disturbing the flocks of waterfowl and suddenly falls on an individual to capture the quarry; food comprises fish, frogs, lizards, aquatic and terrestrial birds.

Voice and calls: Emits metallic notes 'chenb-chenb-chenb'

WHITETAILED SEA EAGLE

66. *Haliaeetus albicilla* (Linnaeus)
(Plate IV, Fig. 14)

1758. *Falco albicilla* Linnaeus, *Syst. Nat.*, ed. 10. 1:89. Type-locality: Sweden.

*Observed at Sambar Lake. January 1957 also in Kailana jheel (water reservoir), Jodhpur, February 1983 (A.K.M.)

Local names: Dāriāi Gārud (Gujarati).

Recognition: A huge white-tailed eagle with a tremendous wing span; size that of a vulture (length 690-860 mm.). Sexes alike, male smaller.

Upper plumage dark brown; feathers of head, nape and sides of neck and breast long and lanceolate, washed with yellowish white; bill stout and sharply curved; chin, throat and underparts brown; upper tail-coverts very long and broad; tail-feathers short, wedged-shaped and white; tarsus stout, moderately long and partially feathered; talons large, strong and sharply curved; in overhead flight, looks very similar to vulture except the characteristic tail colour.

Iris yellow, bill yellow; cere yellow; legs and feet yellow.

Distribution: Palaearctic, visits the West Coast of India wanders inland along river course and also affects large water reservoirs.

Habits and habitat: A rare winter visitor. Essentially a sea-eagle affecting coastal belt; keeps singly or in small scattered parties; flight sluggish; waits for hours near water edge on ground or perched on a branch of tree on edge of water; flies low over the surface of water for quite a distance and then by its stout talons captures fishes; food comprises largely fishes, also waders and small mammals.

Voice and calls: Has not been heard in non-breeding season.

PALLAS'S FISHING EAGLE
67. *Haliaeetus leucoryphus* (Pallas)
 (Plate IV, Fig. 15)

1771. *Aquila leucorypha* Pallas, *Reise Versch. Prov. Russ. Reichs*, 1:454. Type-locality: Lower Ural River.

Local names: Pālās-no Māchhimār Gārud (Gujarati); Māchharāṅg, Machhamanga, Dhenk, Patras (Hindi).

Recognition: A dark brown raptore with a long, big, hooked-bill and a broad white-band on the tail, conspicuous in flight; size that of a vulture (length 760-840 mm.). Sexes alike. Male smaller than the female.

Head and neck-feathers lanceolate; forehead and sides of head whitish; crown and nape chestnut or sandy coloured; upper plumage including wings and tail dark brown; underparts pale brown, darker on the lower abdomen.

Head flat, bill strong and sharp, upper parts of tarsus feathered.

Iris yellow, bill slaty black; cere slaty grey; legs and feet dirty white to light yellow, claws black.

In overhead flight the broad white band of tail with black tips, wing, body and tail in the same plane and down-curved tips of flight feathers of wings identify the bird.

Distribution: Central Palaearctic and Oriental. Occurs in most parts of India including the semi-arid tracts of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Resident, not uncommon along river course, large lakes, dams and large perennial water pools; affects flat plains, perches on large tall trees nearby water; once on wings soars high like vultures and then descends flying low along water surface to pick up fishes or swoop upon waterfowl. Fishes as heavy as three to four kg. are captured by its strong massive talons. Often chases other birds as cormorants, terns, harriers to rob them of their prey; feeds also on carrion. Breeding commences in winter from November to February; nest—large, with slight depression made of big and small sticks and twigs, lined with green leaves, hay and straw, erected on tree-tops near about water by both the sexes, parents share incubation and care of chicks and fledglings.

Voice and calls: A noisy bird specially during breeding period. Emits occasional sharp shrieks.

KING VULTURE
68. *Aegypius calvus* (Scopoli)
(Plate V, Fig. 18)

1786. *Vulture calvus* Scopoli, *Del. Faun. et. Flor. Insubr.* 2:85. Type-locality: Pondicherry, Southeast India.

Local names: Rāj Gidh (Gujarati); Rāj Gidh, Mullā Gidh, Bhāonrā (Hindi).

Recognition: A heavy black and white vulture with reddish bare head and legs; size that of the peacock minus the train (length 840 mm.). Sexes alike.

Head and neck featherless, coloured yellowish red; a pair of fleshy red pendent wattle behind the ears, one on each side; a white patch on the base of the neck; bill curved and strong; breast with a large black and white patch; a conspicuous white thigh patch; in overhead flight whitish band on the underside of each wing and pointed fingerlike wing-quills held well above the line of the back.

Iris reddish brown; bill dark brown, yellowish at the base; legs dull red.

Distribution: Oriental. Found throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; common but nowhere abundant; keeps singly or in pairs; affects cultivated plains and fallow-land; roosts in trees; a carrion feeder, generally feeds singly on carcass, other species of vultures keep the distance while it feeds; breeds in winter and spring (January to April); nests on extreme top of big tall trees where available otherwise goes for stunted trees as *Prosopis* spp. and *Acacia* spp. in arid region, sometimes utilizes nests of other raptorial birds; nest—a flat structure of sticks and twigs, lined with leaves, used years after years; generally a single egg laid; both the sexes incubate; incubation period 45 days; both the partners tend the chick.

Voice and calls: A croak with scream.

BLACK VULTURE
69. *Aegypius monachus* (Linnaeus)
 (Plate III, Fig. 11)

1766. *Vultur monachua* Linnaeus, *Syst. Nat.* ed. 12, 1:122. Type-locality: Arabia.

Local names: Daku (Gujarati); Kala Gidh (Hindi).

Recognition: A clumsy heavy, long-winged vulture with a feathered tuft on head and a ruff around the neck; size, larger than the peacock minus the tail (length 1100 mm). Sexes alike.

Head partially feathered, naked parts dull lead-blue; a blackish brown patch around eyes; crown and cheeks bear black fur-like feathers; culmen (beak) strong, massive and arched; nostrils quadrangular in shape and obliquely placed; neck feathered, sides of the neck bluish; upper and lowerparts blackish brown.

Iris hazel; legs and feet grey.

Distribution: Palaearctic, migrates south of its breeding range to northern India.

Habits and habitat: A winter visitor; irregular; rare; usually solitary, affects plains; a carrion feeder, bold to approach carcass preventing other species of vulture till it finishes its meal; rests on ground and in trees.

GRIFFON VULTURE
70. *Gyps fulvus fulvens* Hume
 (Plate III, Fig. 12)

1869. *Gyps fulvens* Hume, *Rough Notes* 1:15, 19. Type-locality: Punjab.

Local names: Bādāmi Gidh, Pāhādi Gidh (Gujarati); Bhurā Gidh, Motā chāndul Gidh (Hindi).

Recognition: A squat, heavy built, bald-headed, big vulture; size larger than the peacock (minus train), (length 1100-1200). Sexes: alike.

Iris brown; bill yellowish green, cere black; legs and feet dingy or grey.

Head and neck practically featherless but covered with down; base of neck bears a ruff of fulvus lanceolate feathers; bill deep and laterally compressed, culmen strongly hooked; nostril slits perpendicularly placed; upper plumage reddish, fulvus; wings dark brown; wing-quills black, splayed finger-like; tail-feathers almost square and black; lower plumage buff-brown with narrow pale shaft-stripes.

Distribution: Oriental, found mostly in drier parts of India including the arid and semiarid tracts of northwestern India.

Habits and habitat: Migratory, inhabits arid tracts, soars high in the sky in small numbers,

descends on sighting a carcass to feed upon it; roosts from dusk to dawn in trees or ledges of rocks or on cliffs.

Voice and calls: Produces screeches 'kra-kra...' while feeding on carcass.

LONGBILLED VULTURE
71. *Gyps indicus indicus* Scopoli
(Plate V, Fig. 16)

1786. *Vulture indicus* Scopoli, *Del Faun. et. Flor. Insbur.* 2:85. Type-locality: India.

Local names: Bhukhro (Gujarati), Gidh (Hindi).

Recognition: Almost like the Griffon vulture but smaller and having a longer bill; size that of the Whitebacked Vulture (length 920 mm.). Sexes alike.

Head and neck bear light brown down; base of neck bears a rufous ruff; upper plumage buffish earthy brown; lower plumage and insides of the wing uniform greyish buff.

Iris brown; bill yellowish horny; crere olive green; legs and feet plumbeous.

Distribution: Oriental. Found in western and peninsular India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; fairly common; keeps in small numbers near about human habitation; soars high in the sky, dropping down only when a dead animals is sighted; shares food (carcass) with the Whitebacked Vulture in case they flock to the same carcass; perches on vertical rocks or stones, mounds and bunds and walks about with high steps; breeds between November and February; nests in traditional breeding spots in old hill forts, tree-tops, ledges of cliffs, nests are rough platform made of sticks and twigs, lined with leaves and feathers; clutch composes a single egg; both sexes incubate and tend the chick.

Voice and calls: Practically silent, emits a faint croak 'crr, crr...' while competing with other members on carcass sharing.

INDIAN WHITEBACKED VULTURE
72. *Gyps bengalensis* (Gmelin)
(Plate V, Fig. 17)

1788. *Vultur bengalensis* Gmelin, *Syst. Nat.* ed.13 1(1):245. Type-locality: Bengal.

Local names: Gidh (Gujarati), Gidh, Sāfed-gidh (Hindi).

Recognition: A huge dark vulture with a white back; neck and head sunk into shoulder at

rest; size that of the peacock (minus train) (length 895 mm.). Sexes alike.

Head and neck bare covered with dusky plumbeous down; a ruff of short, narrow white down round the base of the neck; upper-plumage blackishbrown with a conspicuous white patch; wings black with whiteband stretching along underside of wings; lower plumage dark brown.

Iris yellowish brown; bill plumbeous, cere horny black; legs and feet greenish plumbeous.

Distribution: Oriental, found throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Very common, less so in arid zone (in recent years range extended to western Rajasthan and northern Gujarat, where infrequently met with) found associated with human habitation, soars high to locate carcass and large numbers congregate to feast on carcass. Breeds between November-March; nest- made of sticks, twigs lined with leaves are erected as platform mostly on top branches of trees; clutch consists of a single egg; incubation period 45 days; both sexes share incubation and tend the chick.

Voice and calls: Produces harsh screech and hiss, and raucous scraping noise.

SCAVANGER VULTURE

73. *Neophron percnopterus percnopterus* (Linnaeus).

1758. *Vultur Percenopterus* (sic) Linnaeus, *Syst. Nat.* ed. 10.1:87. Type-locality: Egypt.

Local names: Khero, Sāfed Gidh (Gujarati), Sāfed-gidh, Kāl-murghāb (Hindi).

Recognition: A white kite-like bird with black flight-feathers; head bare; size that of the Pariah Kite (Length 610-660mm). Sexes alike.

Head, face and upper neck featherless, naked featherless parts yellow; lowerparts of neck bears a ruff of long lanceolate hackle-like buff feathers all around; bill slender, long, hooked at tip; wings long, pointed, greater-coverts pale grey, quills black, tail white, graduated and wedge-shaped.

Iris brown; cere yellow; bill horny; feet yellowish orange.

Distribution: Palaearctic, ethopian and oriental regions, represented by two subspecies. viz., *Neophron p. percnopterus* in northwestern India including arid areas of Kutch and western Rajasthan and *Nephron percnopterus ginglyianus* (Latham) spread all over India (except the areas occupied by the nomante subspecies) including Gujarat.

Habits and habitat: Resident, common, found singly or in pairs; affects warm arid and semi-arid areas, grassland, stony plains, frequently associated with human habitation in town and villages associated with rubbish and garbage; seen perched on mound and boundary walls of old buildings, ruins, ramparts of forts, rocky cliffs, when foraging stalks along roads and in fields with high steps; flight straight, normally low; food comprises putrified carrion, offal or any decaying matter; breeds in spring and summer (February-May); nests on ledges of ruins, rocky

precipices, clefts and crevices, less frequently in trees; nest made of mass of sticks and twigs lined with rubbish feathers, wool, hair, tortoise-shells, skins, animal dung and bones; clutch composes two eggs, both sexes incubate; incubation period 42 days.

Voice and calls: Silent.

PALE HARRIER
74. *Circus macrourus* (S.G. Gmelin)

1770. *Faleo macrourus* S.G. Gmelin, *Reise d Russl*, 1:48. Type-locality: Voronezh, southern Russia.

Local names: Pāttai (Gujarati); Dāstmāl, Girgit mār, Pāttai (Hindi).

Recognition: A longish, slim, long, narrowwinged, longtailed hawk like raptor, slightly smaller than the Pariah Kite (length 460-510 mm.). Sexes dimorphic, female rather larger than the male.

Male: Pale grey above, white below. A white patch round the eye; wings grey tipped black; second to fifth flight-feathers notched on outer webs; breast greyish white; a conspicuous white patch with grey bars on the rump; tail white, long barred with grey.

Female: Upperparts dark brown, a conspicuous rufous owl-like ruff all round its neck; head streaked with dark brown; wing quills dark brown above, whitish below, cross-banded with black and lightly tipped with whitish. Underparts reddish brown to whitish, streaked with dark brown; breast streaked with black, rump white; tail-feathers greyish brown (central), buff (outer), cross-banded with dark brown.

Head roundish hawk-like, a faint nuchal collar present; bill small, festooned and curved; legs long, slender; tarsus unfeathered, claws sharp and well curved.

Iris yellow (male) brown (female), bill horny black; cere lemon yellow; legs and feet chrome yellow; claws black.

Distribution: Central and southwestern Palaearctic, winter south of its breeding range in Indian subcontinent including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan, Gujarat and Kutch.

Habits and habitat: Migratory; winter visitor; fairly common; met with singly, seen perched on mounds or bare ground; flies only a few metres above with motionless wings, gliding and skimming leisurely over the grass fields turning at intervals and with wing-beats rising in circles to a considerable height; quarters the ground in search of quarry, and on sighting the prey, it breaks its speed and remains standstill in air and with agility drops upon its target and after a successful hunt consumes the same on the ground; prey animals comprise terrestrial mammals specially rodents, birds, lizards, frogs and large insects.

Voice and calls: Silent in non-breeding period.

MONTAGU'S HARRIER
75. *Circus pygargus* (Linnaeus)

1758. *Falco pygargus* Linnaeus *Syst. Nat.*, ed. 10, 1:89. Type-locality: Europe = England.

Local names: Patti-Patti (Gujarati); Girgit mār, Dastmal (Hindi).

Recognition: A slender long-winged, long-tailed bird of prey, like the Pale Harrier but darker, size more or less of the Pariah Kite (length 460-490 mm). Sexes dimorphic.

Male: Upper plumage dark grey; throat and breast grey; wing-tips black, a narrow black transverse bar across the inner flight-feathers; underplumage whitish, streaked with rufous on abdomen and flanks; rump greyish.

Female: Confusable with Pale Harrier but darker and underparts buff, streaked with rufous.

Outer webs of second to fourth primaries notched; tarsus short.

Iris yellow; bill hornyblack; cere lemon yellow; legs and feet chrome yellow; claws black.

Distribution: Palaearctic, migrates south of its breeding range largely to the Indian subcontinent including arid and semi-arid tracts of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Migratory, winter visitor, not uncommon; shy and elusive, met with singly perched on a tree; affects agricultural lands, dry scrubby stony and boulderous lands as well as wetland; a swift and agile hunter, hunts in large area covered by its swift flight and leisurely glides a few metres above the ground and on sighting the quarry takes it by surprise; food comprises great variety of terrestrial animals as rodents, hares, birds, lizards, insects, specially locusts; harriers have a common place of roosting, preferring some scrub area, *accacia* trees, tall grassy patch.

Voice and calls: Silent during non-breeding period.

MARSH HARRIER
76. *Circus aeruginosus aeruginosus* (Linnaeus)

1758. *Falco aeruginosus* Linnaeus, *Syst. Nat.*, ed. 10, 1:91. Type-locality: Europe, Sweden.

Local names: Pān Pattai (Gujarati), Kutar, Kulesir, Sāfed Sirā (Hindi).

Recognition: A medium-sized slender hawk, having long wings and tail almost like the Pale or Montagu's Harrier but much darker and relatively heavy build; size, somewhat smaller than the Pariah Kite (length 540-590 mm.). Dimorphic, female larger than the male.

Male: Upper plumage dark rusty brown; head, neck and breast buff or rufous with dark shaft-stripes; a patch of slivery grey on the secondary wing-feathers and wing-coverts; first six primaries black with white bases; rump patch rufous grey; lower plumage ferruginous brown, striped darker.

Female: Differs from the male in having chin and throat dark chocolate-brown; feather of breast rufous, edged with buff; wings and tail bear conspicuous dark brown patches replacing the silvery grey of the male.

Iris yellow, bill black, cere yellowish green; legs and feet yellow; claws black.

Distribution: Palaearctic, the nominate subspecies migrates to southeast, South Asia and Ethiopia. Winters throughout India including well watered spots in the arid and semi-arid tracts of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Migratory; common, seen from October to March; affects swampy terrain, marshes, swamps; lakes, irrigated fields, rests on pillars and posts, dry branches or on ground; takes to flight for foraging with a few wing-beats rising high up then sailing liesurely to descend down, covering a vast area. While sailing a few metres above the ground, it suddenly breaks its glide to fall on its quarry to capture the same unaware; food comprises terrestrial aquatic and amphibious animals as fishes, frogs, snakes, lizards, aquatic birds, wounded birds, chicks of waterfowls.

Voice and calls: Silent.

SHORT TOED SERPENT EAGLE
77. *Circaetus gallicus gallicus* (Gmelin)
 (Plate I, Fig. 4)

1788. *Falco gallicus* Gmelin, *Syst. Nat.* ed. 13 1(1):259. Type-locality: France.

Local names: Sāpmār (Gujarati); Sāāmpmār (Hindi).

Recognition: A large hawk-like eagle with large thick head and big owl-eyes; larger than Pariah Kite (length 630-680mm.). Sexes alike; female a little larger.

Forehead and face covered with black upstanding bristles; forehead, lores and feathers round eye whitish; neck-feathers lanceolate; upper plumage brown with dark feather shaft stripes; wings long, wing coverts greyish brown; primaries black, underwing white tail grey-brown, white on the inner web, barred brown; under plumage white; throat and breast streaked with brown; abdomen whitish lightly barred with brown.

Plumage found in three phases viz. Phase (A)- the normal phase as above; Phase (B)- a few brown streaks on throat and breast; Phase (C)- crown white streaked with brown and the whole underparts white.

Legs (tarsi) long, unfeathered, heavily scaled; claws short in proportion to the size of the bird.

Iris brilliant yellow; bill blackish; cere greyish white; legs and feet dull greyish white; claws black.

Distribution: Indian-African distributed in southwest and central Palaearctic and oriental Regions, represented by the nominate subspecies (*gallicus*) throughout the Indian Peninsula including the arid and semi-arid plains of Punjab, Haryana, Rajasthan, Gujarat and Kutch.

Habits and habitat: Resident and locally migratory. Seen singly perched on trees, sometimes on rocks, affects open lightforested terrain, grassy plains, deserts, broken boulderous scrubby flat country as well as hills. Tireless fliers soar over hill-tops, gliding over to slopes and plains, hovering with gentle, fast wing-beats in the manner of a kestrel to sight its prey and on locating the same suddenly drops on the quarry to capture and on successful hunting carries it up into the air, crushing the same with its sharp talons and consuming it on wings; snakes siezed by their head; killed on ground and sliced in pieces for devouring them bit by bit; food comprises mainly snakes and lizards, also small mammals, birds, insects, etc. Breeding season commences in December and continues till April; nest- saucer-shaped, with a deep hollow in the middle made of small sticks and twigs with green leaf lining erected on tree-tops, generally trees as *Dalbergia* sp. (Seesum), *Acacia* sp. (Babul), *Prosopis* sp. (Khejra), *Azadirachta* (Neem) preferred in scrub woods or in groves and gardens. Both the sexes take part in nest-building; nuptial display on wings and on nest. Pairs soar high up and fly in undulations with different strokes of wings and call melodiously. At the nest the female stands with wings upheld calling at short intervals, the male bringing food for her to appease her; mating takes place at the nest site; clutch comprises a single egg; while the female incubates, the male feeds her; incubation period 47 days; both sexes fend the chicks and extend care to them.

Voice and calls: A loud screamy cry 'piecu. piecu...' emitted during breeding season otherwise silent.

CRESTED SERPENT EAGLE

78. *Spilornis cheel melanotis* (Jerdon)

1844. *Buteo melanotis* Jerdon, *Madras J. Lit. Sci.* 13:166, Type-locality: At the foot of the Nilgiri, South India.

Local names: Chotāliyou Sāpmār (Gujarati); Furj bāj, Dogrā cheel (Hindi).

Recognition: A large brown, crested hawk-eagle, conspicuously ocellated below; size larger than the Pariah Kite (length 740 mm.). Sexes alike; female larger than the male.

Crest bushy, black mixed with white; upper plumage dark purplish brown; wings dark brown with primaries black, barred with brown; tail long, brown and black with a broad whitish band, lower plumage brown spotted with numerous ocelli and barred with dark brown.

In overhead flight wings appear broad and rounded; a black border with a broad white band running across the primaries. Tail partly spread, a broad greyish white band on tail conspicuous, followed by a black terminal band.

Legs strong of moderate length, bare of feathers, covered with scales; toes short, talons short and sharply curved; bill long, strong and curved.

Iris brilliant yellow; bill plumbeous, cere yellow; legs and feet dingy yellow; claws black.

Distribution: Oriental, distributed throughout the Indian Subcontinent, the subspecies

melanotis is represented in southern penninusular India including Gujarat(Saurashtra).

Habits and habitat: Resident, locally migratory and a wanderer; keeps singly or in pairs; bold and confiding, allowing close approach; affects deciduous forest close by water source; perches on higher branches of trees well concealed by foliage; soars high up over forest areas; hunts from its perch, patiently waiting for its prey to appear within its hunting range on the ground when it drops vertically on the quarry; food comprises snakes, lizards, frogs, crabs and insects; breeding commences in February and lasts till early April; parts of nuptial display composes soaring high up along with noisy calls, also rolling by partially closing wings and raising the tailfeathers, nest- cup-shaped, made of sticks and twigs lined with green leaves and grass, erected on a fork of a branch; clutch consists of a single egg; the female incubates alone; both sexes extend care to the chicks and fledglings.

Voice and calls: A plentive shrill call, whistling two short notes 'kuk kuk' followed by long ones 'queear-queear, queear' specially emitted during breeding season, heard even while the eagle soars very high up in air.

OSPREY

79. *Pandion haliaetus haliaetus* (Linnaeus) (Plate II, Fig. 6)

1758. *Falco haliaetus* Linneus, *Syst. Nat.* ed. 10, 1:91. Type-locality: Europe-Sweden

Local names: Māchhimār (Gujarati); Māchilamār, Māchhariyā; Māchhmangā (Hindi).

Recognition: A large dark brown and white hawk somewhat smaller than the Pariah Kite (length 560 mm.). Sexes alike; female larger.

Upper plumage dark brown; crown white; feathers of head and nape pointed, lengthened, tufted with white and brown feathers; a dark brown band from behind eye to nape; underplumage white; chin and throat white; a broad streaked pectoral band across the upper breast.

Bill strongly hooked, wings long and narrow; outer primaries blackish; tail brown barred with dark brown, square, falls short of wings; legs moderately long, unfeathered, thickly scaled; toes very powerful with prickly scales on soles.

Iris pale yellow, bill black, cere light grey bluish, legs and feet greenish white; claws black.

Distribution: Cosmopolitan, the subspecies (nominate) belongs to the palaearctic region and migrates south of its breeding range and wintering throughout the Indian subcontinent including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan, Gujarat in wetland.

Habits and habitat: Migratory, mainly a winter visitor, constantly associated with sea-coast, estuaries, and inland water; large lakes, dams irrigation tanks and rivers; keeps singly or in

pairs; perched on trees at edge of water; a skilled fisher, fishing from its perch by flying a few metres above the surface of water with a few flappings and long glidings and on sighting a fish hovers briefly in flight with legs projected fully and then after a swoop dives into water on its prey in water with wings half closed, and gripping the fish sometimes of pretty big size, (two or three kg.) is lifted, the prey carried by both the feet, the head held upwards, food comprises mainly fishes, frogs, waterbirds, chickens and mammals.

Voice and calls: Usually silent in non-breeding season.

SAKER OR CHERRUG FALCON
80. *Falco biarmicus cherrug* J.E. Gray.

1834. *Falco cherrug* J.E. Gray, *Ill. Indian zool.*, 2:25. Type-locality: India.

Local names: Cherugelo (male), Cherug (female) (Gujarati); Chārgela (male), Charg (female) (Hindi).

Recognition: A large brown bird of prey with large pointed wing; size between Jungle Crow and Pariah Kite (length 500-560 mm.). Sexes alike, female slightly larger.

Head cream-white; crown and nape pale rufous, streaked with black shafts; upper plumage grey-brown, feathers broadly edged with rufous; underplumage white, blotched and streaked with brown; and indistinct dark streak from behind the eye to nape and dark brown moustachial streak; chin white; wing-feathers deeply notched, inner web of the primaries bear broad white bars; tail pale brown with large oval white spots; flanks and thighs spotted.

Bill moderately sized with sharp hooked tip and a conspicuous tooth behind the tip of the bill; legs (tarsi) featherless except on the upperpart; claws sharp and curved.

Iris dark brown; bill yellowish white; cere dull yellow; legs and feet yellowish green; claws black.

Distribution: Palaearctic, discontinuously distributed, migrates to north and west India including the arid and semi-arid tracts.

Habits and habitat: Migratory; winter visitor; affects scrubby, open plains and cultivation, inhospitable desert tracts; keeps in pairs; perches in trees and from its perch it soars 15-30 metres high and hovers for sometime to swoop at the opportune moment on its prey; very powerful and aggressive, hunts birds large and small in air and mammals, reptiles and frogs on ground.

Voice and calls: Generally silent.

LAGGAR FALCON
81. *Falco biarmicus jugger* J.E. Gray

1834. *Falco jugger* J.E. Gray, *Ill. Indian Zool.* 2: pl. 26. Type-locality: India.

Local names: Juggāḍ (male), Lāggāḍ (female) (Gujarati); Jāggār (male), Lāggār (female) (Hindi).

Recognition: An ashy brown falcon having black and white stripes on head and conspicuous moustachial streak, a longer tail and pointed wings; size, somewhat larger than the House Crow (length 430-460 mm). Sexes alike, female larger.

Forehead, lores and a line above the eyes to the nape pale rufous, crown and nape brown with black shaft-streaks; moustachial streaks dark brown; eyes encircled with black and a broad black streak extends from eye to the nape; upper plumage dark brown; upper tail-coverts greyer with black shafts; tail grey-brown tipped white, except for the central tail-feathers, all barred dark and light; wings brown, primaries dark brown, inner webs barred with broad white; lower plumage white; breast streaked with brown, abdomen spotted with brown,

Iris dark brown; bill slaty grey, tipped black; cere yellow; legs and feet yellow; claws black.

Distribution: Oriental, found throughout the Indian region including the arid semi-arid tracts of northwestern India.

Habits and habitat: Resident, not uncommon in its preferred habitats; keeps in pairs, perches in trees, also on rocks or buildings; affects open country, cultivated plains dotted with trees, sometimes in the vicinity of villages and towns, avoids forests; a fine flier, sporting together swooping to hunt, driving the prey towards each other to capture it tactfully; food comprises mainly birds, also mammals, largely rodents, reptiles and large insects; breeds in winter (January-March) nuptial display composes chase of the female by the male, soaring together and calling over the nesting site and when settled on the nest, the female being fed by the male; nest saucer-shaped, made of sticks and twigs, lined with straw and leaves erected high up in trees, sometimes in hollows on the rocky-ledge or tops of buildings, at times the pair usurps the nest of other raptorial birds or jungle crows, also occupies abandoned nest of other birds, and utilizes the same after necessary repairs; clutch consists of two to five eggs; both the sexes incubate; female feeds the chicks with young birds; both the parents react aggressively towards intruders to fend the chicks and fledglings.

Voice and calls: Usually silent except during the breeding period or when excited; calls 'whi-eee-eee' in shrill notes, sometimes prolonged.

RED-CAPPED PEREGRINE FALCON 82. *Falco peregrinus babylonicus* P.L. Slater

1861. *Falco babylonicus* P.S. Slater, *Ibis*, 218, pl. 7. Type-locality: Oudh (Uttar Pradesh), India.

Local names: Lāl-māthāni Sāheen (Gujarati); Shāheen, Sāfed Sāheen (Hindi); Lālsir Shāheen (Punjabi).

Recognition: A slim, streamlined powerful, stocky-built bluish grey falcon; size somewhat

larger than the House Crow (length 380-460 mm). Sexes alike, female larger.

Crown and nape rufous to buff, feathers of crown dark-centred; upper plumage pale bluish grey with blackish centres; a distinct nuchal russet collar; upper tail-coverts pale grey; tail short, blue-grey barred black and tipped greyish white; wings rather short, sharply pointed, wing-coverts bluish grey except the primary coverts which are blackish with white tips; eyes encircled with black, a conspicuous black moustachial streak and ear-coverts; chin and throat white; breast and abdomen buffish to pinkish white and sparingly barred with black.

Iris dark brown, bill dark grey with black at tip; cere bright yellow; legs and feet bright yellow; claws black.

Distribution: Palaearctic, ranging from west Asia to East Asia, migrating south of its breeding range to north and west India including the arid and semi-arid tracts.

Habits and habitat: A winter visitor; affects barren desert country and rugged, rocky, broken hilly terrain; not uncommon; keeps in pair; roosts in rocks or dry branches of trees; from time to time darts from its perch, exhibiting flight perfection at tremendous speed, stooping to capture its quarry; sometimes mock attacks made to disturb and harass other birds; food comprises mainly birds as sandgrouse, partridges, pigeons and small passerines; more active at dusk and dawn; flies high up on migration.

Voice and calls: Silent in non-breeding season.

SHAHIN FALCON

83. Falcon *peregrinus peregrinator* Sundevall

1837. *Falco peregrinator* Sundevall, *Physiogr. Sällskapets Tidsskr.*, 1 (2):177, pl 4. Type-locality: At sea in lat 6° 20' N between Ceylon and Sumatra, 70. Swedish miles (= about 700 mm) off the Nicobars.

Local names: Shāhinchā (male); Shāhin (female) (Gujarati); Kohilā (male), Shāheen Kohi (male) (Hindi).

Recognition: A streamlined, broad-shouldered dark falcon, more or less the size of the Jungle Crow (length 380-460 mm). Sexes alike, female larger.

Head black; moustachial stripes broad and prominent; nuchal collar absent; upper plumage dark greyish black with blackish centres to feathers; wing-coverts slaty black; wing long, tips pointed, reaching the tip of the tail; lower plumage buff to rusty reddish brown; breast deeply rufous; abdomen to under tail-feathers heavily cross-barred with black.

Iris deep brown; bill bluish slaty; cere yellow; legs and feet orange-yellow; claws slaty black.

Distribution: Oriental, found throughout the Indian region as far east as Burma and south China, breeding mostly in the northwestern mountains of the Himalayas, also in the Peninsular hills including the Aravallis and the Girnar (Gujarat).

Habits and habitat: Resident, uncommon in plains but frequently met with in forested hills,

and around rocky hilly terrain; keeps in pairs; its acrobatic feats and manoeuvres to hunt surpass all other birds of prey taking the quarry unawares swooping on it with extreme accuracy at thunderbolt speed; pairs mostly hunt together with an understanding of tactical attack killing or capturing birds on their wings with its strong, sharp, piercing talons, lifting the victim up in air and then descending to the ground or on some branch to consume the same; forages mostly at dusk and dawn; food comprises mostly birds as parakeets, nightjars, pigeons and doves, partridges, bustards and floricans, waterbirds and crows, sometimes bats; said to breed in rock-cliffs, not observed to breed in arid and semi-arid areas.

Voice and calls: Silent in non-breeding season.

HOBBY

84. *Falco subbuteo subbuteo* Linnaeus

1758. *Falco Subbuteo* Linnaeus, *Syst. Nat.*, ed. 10, 1:89. Type-locality: Europe Sweden.

Local names: Dhūtār (male), Dhoti (female); Morāssāni (Oudh, Uttar Pradesh).

Recognition: A streamlined dark falcon having long scythe-like wings overlapping the length of the tail; size that of the Rock Pigeon (length 310-340 mm). Sexes alike, female larger.

Upper plumage dark slaty, a broad black moustachial stripe; crown brown-slate with narrow dark shaft-stripes; tail unbarred except the outer tail-feathers; chin and throat white; breast whitish, heavily streaked with black; underparts white, conspicuously streaked with black; thighs and under tail-coverts rusty red.

Iris dark brown; bill plumbeous with bluish black tip; cere bright yellow; legs and feet yellow; claws black.

Distribution: Palaearctic, winters south of its breeding range to Africa, southern China and India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, winter visitor; keeps solitary or in loose scattered parties but gregarious on migration; affects bush, semi-desert and winter dry country with scattered and isolated patches of trees, cultivated and open grassy plains; agile, flight peregrine-like, swift and graceful, flies low with a few strokes of wings and short glides; rather crepuscular, loves to hunt in early morning and late evening hours hunting birds in flight, tactfully like the peregrine; hawks winged-insects and smaller birds in flocks, overtaking them by its lightning speed and on its successful capture rises up in air lifting the booty to devour the victim on wings like the kite; perches in trees while it rests.

Voice and calls: Silent in winter quarters.

REDHEADED MERLIN
85. *Falco chicquera chicquera* Daudin

1800. *Falco chicquera* Daudin, *Traite d' Orn.* 2:121. Type-locality: Bengal.

Local names: Chătvā (male), Turumti (female) (Gujarati): Turumtāri, Turumti (Hindi).

Recognition: A small, slim, chestnut-headed, ashy-grey falcon; size that of the Rock Pigeon (length 310-360 mm). Sexes alike, female larger.

Head, nape, ear-coverts and cheek-stripe chestnut; lores and sides of forehead whitish, upper plumage bluish grey, each feather with a black shaft-line; wing-quill blackish, closely barred with white on the inner webs; tail greyish barred black and a broad subterminal black band, terminal tail-end white; upperbreast white, lightly streaked with blackish brown; abdomen and flanks white barred with black.

Iris light brown; bill greenish yellow, tipped blue-black; cere yellow; orbital skin yellow; legs and feet yellow, claws black.

Distribution: Throughout the Indian subcontinent including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Resident; infrequently seen; keeps in pairs; sedentary; keeps to a chosen haunt; affects wide cultivated plains, interspersed with trees and near villages; very bold and dashing; flight graceful and very swift; flies with a few wing-beats and glides with sudden and swoops at its prey with lightening speed and whisks off the quarry; hunts generally in pairs, the hunting company skillfully drives out the quarry from the hide and as soon as the quarry is exposed the other partner hunts it on wings; birds as large as a pigeon, partridge, quail, jay, fall prey; food comprises birds mainly, also bats, mice, lizards etc.; breeds in winter (January-March); very noisy and excited, constantly flying over the perch which indicate courting; nest-made of sticks and twigs, lined with grass roots, erected on well foliated tree, sometimes old nests of kites and crows appropriated and made use of after necessary repairs and alterations, both the sexes take part in nest-building; clutch comprises three or four eggs and mainly the female incubates.

Voice and calls: Emits shrill continual screams- 'tiririri-tiririri'

KESTREL
86. *Falco tinnunculus tinnunculus* Linnaeus

1758. *Falco Tinnunculus* Linnaeus, *Syst. Nat.* ed. 10, 1:90. Type-locality: Europe = Sweden.

Local names: Lārji (Gujarati): Kārontiā, Koruttiā, Khermutiā, Nārzianāk (male), Nārzi (female) (Hindi).

Recognition: A streamlined small reddish falcon with pointed wings and long fan-shaped rounded tail, size that of the Ring Dove (length 360 mm).

Male: Crown and side of the neck ashy grey; cheek-stripe dark grey; upper plumage pale

chestnut, spotted sparingly with black rump and upper tail-coverts blue-grey; tail grey with a black broad subterminal band and tipped greyish white; underparts light buff with brown spearhead spots.

Female: Forehead creamy, crown rufous brown, streaked with black; upper plumage rufous brown cross-barred with black; primaries dark brown, inner webs with much white; tail rufous brown, barred with black, subterminal band broadest; lowerparts rufous fawn; breast spotted with brown.

Iris dark brown; bill slaty black; cere and orbital skin yellow; legs and feet orange-yellow; claws black.

Distribution: Palearctic, migrates to the Indian subcontinent including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory; winter visitor; keeps singly; affects cultivated and grassland of hilly terrain and plains; seen perched in branches of trees, telegraph poles or mounds; often hovers in flight to locate quarry and dives to capture the prey and return to the perch with success of capture; food comprises mostly insects as grasshoppers, locusts, crickets, beetles, termites, lizards, small birds and rodents.

Voice and calls: Generally silent in winter, emits shrill scream 'kee-kee-kee' in late spring.*

BLACK PARTRIDGE

87. *Francolinus francolinus asiae* Bonaparte

1856. *Francolinus asiae* Bonaparte, *Compt. Rend. Acad. Sci. Paris*. 42:882. Type-locality: Gurgaon, Haryana.

Local names: Kāro-titār (Gujarati); Kālā-titār (Hindi)

Recognition: Male jet black, plump, jungle fowl-like with a short tail and a conspicuous white cheek-patch; size that of a medium village hen (length 340 mm).

Female: Upperparts brown, mottled and speckled black and white; white cheek-patch absent; chin and throat buff; underparts scalloped and barred black and white.

Iris hazel brown; legs and feet brick-red; bill black and brown.

Distribution: Found in well-watered areas of the northwestern India including the arid and semi-arid tracts.

Habits and habitat: Resident, not uncommon in suitable well-watered country; found singly

* March 1983-Jodhpur, W. Rajasthan (A.K.M.)

or in pairs, sometimes in parties of 3 or 4; forages in grassland and among crop at the edges of forest, shrub and grass covers and while picking up morsel cocks its tail, quickly retreating under thick cover with slight alarm; food comprises cultivated grain, wild grass seeds, tender shoot and leaves, insects specially termites and ants, also beetles. Breeding season commences in summer and continues till autumn; nest- a shallow grasslined saucer arranged in a depression under bush, sometimes in grassland among thick grass, well concealed; clutch consists of 6-8 eggs, incubation period 18-19 days, solely done by the female.

Voice and calls: A high-pitched 'chick...chick chick-kreekek,' repeated at intervals and responded by other members, emitted at dusk and dawn.

PAINTED PARTRIDGE

88. *Francolinus pictus pallidus* (J.E. Gray)

1831. *Perdix hepburnii* var. *pallida* J.E. Gray, in Gray & Hardwicke, *Ill. Indian. Zool.* 1 (8): pl.55. Type-locality: Udaipur, Rajasthan, India.

Local names: Tālyo-titār (Gujarati); Chintā-titār (Hindi).

Recognition: A typical partridge, white spotted above and black barred below; legs without spurs; size that of the Grey Partridge (length 310 mm). Sexes alike.

Crown, neck and sides of the head chestnut; throat bears a light yellow patch and a black line instead of a red collar present in the Black Partridge; upperparts light reddish brown, wings chestnut and barred; upper tail-coverts finely barred with black and white; outer tail-feathers blackish; breast and lowerparts whitish, barred black; under tail-feathers rufous.

Iris orange-brown; bill dark brown; legs and feet dull orange.

Distribution: Drier parts of peninsular Indian south of a line roughly drawn along the south border of Uttar Pradesh to Karnataka, West to Punjab, Haryana, Rajasthan, and Gujarat.

Habits and habitat: Resident, not uncommon in flat and plateau country supporting deciduous biotope; keeps in pair or in family parties in scrub jungles and grassland in light open forest and along forest margins contiguous with cultivation; a skulker; lies low in bush when suspicious and on being cornered rises with noisy wing-beats flying a short distance to drop on ground and runs fast, lowering its head and erecting its tail in the manner of the Jungle-Fowl; roosts under bushes on ground as well as up on the tree; food comprises seeds of wild grass and grass shoots, berries, drupes and cultivated grain, also insects, specially termites; breeding commences with monsoon (June-October); cock monogamous; nest scraped in the ground, the depression thinly lined with grass and leaves, nesting sites are under cover of scrubs, in grass patches, cultivated crop of millets and sugarcane; clutch consists of four to eight eggs; the female alone incubates.

Voice and calls: Normally keeps silent, during breeding period the male calls vigorously with head lifting high in air; notations high pitched 'click, click, click ... cheek-cheek-kerary-keray-keray ...' once every 15 to 20 seconds for a quarter of an hour.

NORTH INDIAN GREY PARTRIDGE
89. *Francolinus pondicerianus interpositus* Hartert

1917. *Francolinus pondicerianus interpositus* Hartert, *Nov. Zool.* 24:288. Type-locality: Oudh = Eastern Uttar Pradesh.

Local names: Khādyo-tētār (Gujarati); Teetār, Rām-teetār, Sāfed-tētār (Hindi).

Recognition: A plump, brown partridge with stub-tail and short wings; size that of a medium size hen (length 330 mm); sexes alike.

Crown and nape brown; forehead chestnut, a buff streak from lores extending behind the eye; upper plumage light greyish brown with a chestnut wash, tail-feathers chestnut; chin rufous buff; centre of throat creamy-white and bears a thin blackishbrown gorget; the greyish brown of the mantle crossed with a white band bordered with dark brown; breast and abdomen buff with narrow dark brown cross-bars; legs provided with a short sharp spur in male, less developed in female.

Iris hazel, bill plumbeous; legs dull red.

Distribution: Upper India including Gujarat, Rajasthan and eastern Punjab and through Gangetic plains to the western part of West Bengal.

Habits and habitat: Resident and locally migrant; common; keeps in pairs or in coveys of four to a dozen; inhabits dry open grass and scrubby land, sandy waste and broken country, also in the vicinity of cultivation, hedgerows and thickets near villages, covey move fast from bush to bush in search of morsel scratching the ground; when flushed takes to wings with a loud whirl flying swiftly and gliding up to a short distance to land quickly to take refuge under thorny bushes, cacti thickets or tall grass bushes; in the evening roosts in trees or in tall bushes; food comprises largely wild seeds as well as cultivated millets, sorghum, wheat, maize, pulses and oil seeds also wide variety of insects specially ants, termites, grasshoppers and beetles. Breeds in two definite seasons, from March to May and August to October. Males very pugnacious, ardent fighters and monogamous. Nests on ground in scrapes made by the hen, nest lined by grass and leaves at the bottom of hedges or isolated clumps of cactus; clutch comprises four to eight eggs, only the hen incubates the eggs, incubation period 18-20 days.

Voice and calls: Loud shrill notes 'pat-ee-la, pat-ee-la, pat-ee-la...' rising gradually to high pitch, emitted early in the morning and late in the evening.

GREY QUAIL
90. *Coturnix coturnix coturnix* (Linnaeus)

1758. *Tetrao Coturnix* Linnaeus, *Syst. Nat.* ed. 10, 1, 161. Type-locality: Europe, Asia, Africa, Restricted type-locality: Sweden.

Local names: Ghāgās Bāter (Gujarati); Bāter, Bādā Bāter, Ghāgus Bāter (Hindi).

Recognition: A plump diminutive partridge like bird, size that of a fortnight old chick (length 200 mm).

Upper plumage sandy-coloured, streaked and mottled with black and white and barred with rufous; head striped; streak over eye to hind neck pale buff; wing short, quills brown barred with rufous; tail stumpy, tail-feathers blackish brown with pale shaft-streaks and transverse bars.

Male: Chin and throat black, a black anchor mark on the throat; cheek whitish with two crescent-shaped black streak on each side; breast buff coloured.

Female: Chin and throat creamy buff; breast with longish black spots, abdomen dirty white.

Distribution: Widely distributed in the Palaearctic and the Tropic in the Oriental Region; resident as well as migratory in most parts of the India including the arid and semi-arid parts of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: A few resident, mostly passage migrant; arrives in large flocks in successive waves, keeping in pairs or loose parties; affects cornfields, grassland, bushy undercover in light forests; on close approach flocks explode with a whirl of wings, taking off one by one, vertically rising in air to a height of two to three metres with squeaks, flying fast and straight for a few metres before dropping on the ground to disappear under dense cover; feeds chiefly on grains and seeds largely of wild grass, berries, drupes, cultivated crop seeds, insects specially termites; breeds from March to May; nest- a hollow, scratch in the ground, thinly lined with leaves and grass, well concealed in bushes and standing crop; clutch comprises three to a dozen eggs.

Voice and calls: Loud whistling note followed by two short ones 'wet-my-lips' heard in morning and evening hours.

THE BLACKBREASTED OR RAIN QUAIL.

91. *Coturnix coromandelica* (Gmelin)

1789. *Tetrao coromandelicus* Gmelin, *Syst. Nat.* 13 ed. 1(2):764. Type-locality: Coromandel Coast.

Local names: Chināḡă băter (Gujarati); Chinā băter (Hindi).

Recognition: An obliterative coloured bird very similar to the Common Quail except for the absence of rufous bars on the outer webs of the primary quills, also in being smaller and having a different voice; size, a little bigger than the House Sparrow but plumps and squat (length 180 mm).

Male: Face and throat marked with black patches; upperparts striped with brown and pale fawn; breast distinctively black; lowerparts pale buffy cream; flanks conspicuously streaked with black.

Female: Indistinguishable from the Common Quail except in being smaller.

Iris brown; bill horny black in male, brown in female; legs and feet pale fleshy.

Distribution: Practically throughout the Indian subcontinent including Punjab, Haryana, Rajasthan, and Gujarat.

Habits and habitat: Resident but locally migrant. fairly common in monsoon and winter. Keeps generally singly except during the breeding season when in pairs; affects dry and short grass in open country, rocky broken or cultivated crop-fields often near villages and fallows studded with bushes; birds concentrate in foraging ground, feeding mostly on cultivated seeds, grain, wild grass-seeds and insects. With the commencement of rains birds arrive in large numbers and heard everywhere, seen in pairs running from cover to cover or flying straight for short distances; breeding commences in July and continues throughout rains till November; courting of pairs include chasing of the female by the male and the latter calling vigorously challenging rival birds; nests in depression scraped in ground among standing crop or short grass, nest lined with grass and leaves; clutch consists of five to a dozen eggs; hen incubates alone; incubation period undetermined.

Voice and calls: Normal call, musical double note but resonant 'whit-whit, whit-whit' repeated a number of times, when alarmed emits a short sharp whistle 'wee' followed by a 'truck' after take off in air.

JUNGLE BUSH QUAIL

92. *Perdica asiatica asiatica* (Latham)

1790. *Perdix asiatica* Latham, *Index Orn.* 2:640. Type-locality: Mahratta region, India.

Local names: Vāṇā Lāvāri or Vāṇā Bhādākiyium (Gujarati); Lowwā (Hindi).

Recognition: A small squat and plump dark blackish partridge looking bird, size that of a fortnight old chicken (length 170 mm.).

Male: Face and throat brown and buff; a broad and conspicuous cream-coloured supercilium from forehead to the sides of the neck, a similar stripe under the eyes; crown mottled with dull chestnut and blackish brown; mantle broadly striped with straw-brown and mottled with black and buff; wing feathers brown vermiculated with dark brown and barred with buff, inner webs of primaries brown throughout; tail pinkish brown, each feather cross-barred and black-edged; face, chin and throat bright chestnut; underparts white, closely barred with black.

Female: Upper plumage like the male, lowerparts reddish vinous-pink.

Iris orange-brown; bill horny-black; legs and feet pale orange.

Distribution: Patchily distributed in Peninsular India including Rajasthan (Marwar, Jaisalmer, Sambhar Lake, the Aravallis, Mt. Abu), Gujarat (Gir) in the West and South to

Tamil Nadu and Karnataka, and East to Bihar and Orissa.

Habits and habitat: Resident, common, keeps in small coveys of a dozen or more confined largely to the fort, sometimes to its edges; inhabits scrubby and bushy undergrowths of dry light-deciduous forests of plains and hilly terrain upto 1300 m; generally keeps to the forest floor running from one cover to another in a file but takes short flights when disturbed, suddenly rising with chirps and whirr or wings, flying in all directions and falling in bushes to disappear fast; feeds largely on grassweed-seeds and small insects, specially ants and termites; breeds from autumn through winter to spring; male pugnacious during the breeding season and monogamous; nest scraped in ground under cover of scrubs or grass with a grass lining; clutch consists of five to seven eggs; incubation done by the hen only, period of incubation 16-18 days.

Voice and calls: A laudable musical note 'tiri-tiri-tiri-tiri-....' signalled by the scattered members to reunite and organise the covey; during the breeding time produces an agitated note 'chee-chuck-chee-chuck'

RAJASTHAN ROCK BUSH QUAIL

93. *Perdica argoondah meinertzhageni* Whistler

1937. *Perdica arogoondah Meinertzhageni* Whistler, *Bull. Br. orn. Cl.* 58:9. Type-locality: Nasirabad, Rajputana.

Local names: Lāvāri, Bhāḍākiyun (Gujarati); Lowwā (Hindi).

Recognition: A squat and plump partridge-like bird with short thick bill and round wings, somewhat smaller than the Grey Quail (length 170 mm).

Confusable with the Jungle Bush Quail except that in the male the buff streak above the eye absent, throat patch dull brick-red instead of bright chestnut and in female total absence of the red throat patch.

Male: Head dull chestnut mottled with blackish brown; upper-plumage dark brown; upper back streaked and rump barred harmonizing with rocky background; wings brown vermiculated with dark brown, feathers barred with buff; lowerparts light grey, barred with black; legs with a short blunt spur.

Female: Upperparts fulvous brown streaked and mottled with black and buff, chin whitish; lowerparts pink-brown and unbarred; rest as in male.

Iris light orange-brown; bill slaty black; legs and feet orange.

Distribution: Arid parts of Upper India, includes southeastern Punjab, Haryana in the north Rajasthan (Jalor, Jodhpur, Ajmer, Nasirabad), northern Gujarat, Kutch, Saurashtra (Gir) in the west, Uttar Pradesh in the east and limited approximately to 22° N. Latitude in South.

Habits and habitat: Resident, not uncommon in stony scrubs, dry rocky arid flats as well as hilly terrain; keeps in coveys of half a dozen to one moving from one bush to another in a single file running fast and seldom taking to wings unless hard pressed when the whole flock rises with whirr of wings dispersing in all directions and soon reuniting by signalling to each

other by their soft whistling calls; forages under shrubs and around bushes; food comprises wild seeds, tender grass blades and leaves and variety of small insects; males pugnacious during breeding period and monogamous; breeding commences in spring through autumn to early winter; nests in scrapes made in ground with light grass linings under thorny bushes or bushy thickness; clutch consists of four to eight eggs, only the hen incubates, incubation period, 16-18 days; both the parents extend care of the chicks.

Voice and calls: A soft continuous whistle 'pee-pee-pee-pee-pee-'.....'

RED SPURFOWL

94. *Galloperdix spadicea caurina* Blanford

1878. *Gallapordix spadices* var. *caurina* Blanford, *Fauna Brit. Ind. (Birds)* 4:107. Type-locality: Mt. Abu, in southern Rajputana (= Rajasthan).

Local names: Chokhārā (Gujarati); Choti Jāngli-mūrghi (Hindi).

Recognition: Looks somewhat intermediate between of the Jungle Fowl and the Grey Partridge bearing a long tail and sharp spurs on legs, size that of a half grown domestic hen (length 360 mm).

Male: Crown dark brown; upper plumage including the rump and tail uniform greyish chestnut, mantle feathers edged grey; wings short and rounded, wing quills dark brown; chin whitish; breast and upper abdomen brick-red; lower plumage brown; each leg provided with two or more spurs.

Female: Upper plumage very pale with no rufous tinge, each feather pencilled with two black bars, breast and flanks bright ferruginous tipped black; lower plumage brown mottled with black; each leg provided with not more than two spurs.

Iris yellow, bare orbital-skin red; bill horny brown reddish at the base; legs red.

Distribution: Southern parts of Rajasthan and northern Gujarat in the foothills and hilly tracts of the Aravallis. Introduced in Bhavnagar, Saurashtra where reported to be doing well.

Habits and habitat: Resident, not uncommon in broken hillocks enveloped by thin forest having scrubby undergrowths; keeps in pairs or in small parties of three to six; a shy and secretive skulking bird; generally escapes by running fast, dodging from cover to cover, hiding and comouflaging with the background to escape notice; when flushed, flies swiftly but low and for a short distance emitting startling cackling note, the bird rather heard than seen; forages throughout the under dense undergrowth but roosts in trees at night; food comprises wild seeds and shoots, berries, drupes, tubers, insects, land molluscs; breeds in spring and summer, cock monogamous; nest scraped in ground under cover of scrubs and thorny thickets, thinly lined with leaves and grass; clutch comprises three to five eggs, only hen incubates.

Voice and calls: A domestic hen's call 'kuk-kuk-kuk-krak' when in distress, normally emits cackling calls 'ta-ghank, ta-ghank-tuk-tuk-tuk-taghank'

GREY JUNGLE FOWL

95. *Gallus sonneratii* Temminck

1831. *Gallus sonneratii* Temminck, *Pic. et. Gall.* 2:246. Type-locality: India = Eastern Ghats near Madras.

Local names: Jungli Mūrgho (Gujarati); Jungli Mūrgā (male), Jungli Mūrghi (female); Komri (Marwari in Mt. Abu).

Recognition: Almost like the domestic fowl, the male having neck and rump-hackles and a long arching sickle-shaped laterally compressed tail; female without hackles and have white markings on the undersurface; size that of the domestic fowl, hen smaller (length 600-800 mm cock).

Male: Crown bears a fleshy comb and pendulous crimson wattle on the sides of the throat; neck-hackles from a cape, each feather of the hackle yellow and black spotted design; upper plumage white, streaked with dark grey, mantle tipped with golden yellow spots and streaks; wings glossy black, feathers pale-shafted and pale-edged; median coverts long, lanceolate, brownish orange and creamywhite spotted; tail black glossed with purple, green and bronze, lowerparts brownish grey with lanceolate black feathers striated with white and edged with silvery grey; flanks ferruginous brown; legs provided with a sharp spur on each.

In non-breeding season neck-hackles and tail-feathers replaced by short black feathers; comb and wattle get reduced.

Female: Crown bears traces of comb and bare skin round the eye; crown and neck brown with pale shafts and edges to the feathers; upperparts blackish brown, finely streaked with white, chin and throat whitish, breast white conspicuously scalloped with black.

Iris orange-red; bill horny-brown; legs and feet horny-yellow; claws black.

Distribution: Southern and western India including the hilly terrain of southeastern Rajasthan and contiguous northern parts of Gujarat.

Habits and habitat: Resident, common, essentially a forest bird inhabiting forest-clad hilly tracts from foothills to tops; keeps solitary or in pairs, shy, remains inactive during the day taking shelter in safe areas specially thorny shrubby and bushy undergrowth of forests. Foraging activities are resumed in the morning and evening, feeds in the same area in fixed hour of the day; food comprises grain, seeds, small fruits, berries, tender shoots, insects and grubs. When pursued runs emitting cackling note, in crouching posture, neck outstretched and finally takes to wings for some distance and roosts in trees; at night also sleeps in trees. Breeding season commences with advent of rains generally from September to November; nests in a scraped depression made by the bird on ground and a lining provided of sticks, twigs, grass and leaves; clutch consists of four to seven eggs, only hen incubates, incubation period, 20-21 days.

Voice and calls: During breeding season the male crows, emitting shrill notes 'kuch-kuch-

kaya-kaya-kuch' terminating with double syllable 'kyukun, kyukun'; in distress emits curious note 'kuk-kuck-kuk'

COMMON PEA FOWL
96. *Pavo cristatus* Linnaeus

1758. *Pavo Cristatus* Linnaeus, *Syst. Nat.* ed. 10, 1:156. Type-locality: 'India orientali Zeylona' (= India).

Local names: Mōr (cock), Dhel (hen); Māyurā, Mājūrā, Mōr (Hindi)

Recognition: A dimorphic pheasant; male resplendent, colourful blue-green with a fan shaped crest and a long train; size that of a goose excluding the train of the cock (length 2000 to 2500 mm including the train); female smaller than the male, less impressive and lacks the train.

Male(breeding): Head-feathers short, metallic blue, crown bears a beautiful fan-shaped, spatula-tipped crest, erected on bare shafts; a white patch under the eye; a long slender blue neck; upperparts covered with scaly median feathers washed with copper; scapulars and median wing-feathers barred black and buff; wing-quills and coverts chestnut; secondary black; upper tail-coverts 'train' from a group of long ocellated barbs, each ocellus deep blue, surrounded by two broad rings of blue and bronze; tail dark brown; breast glossy bright blue; under tail-coverts black; a spur on leg above the hind toe.

Female: Head rufous-brown; crown bears a crest similar to that of the male; upperparts brown; wings dark brown; tail dark brown; lower neck metallic green; breast and abdomen buffy white.

Iris dark brown, bare skin around the eye and face white; bill horny brown; legs and feet dusky grey or blackish brown.

Distribution: Greater part of India and Sri Lanka including the whole of Rajasthan and Gujarat (wild as well as feral).

Habits and habitat: Resident, highly adaptable, inhabits moist deciduous, deciduous and dry deciduous forests intersected by rivers and streams in plains as well as in hills, open country, in and around villages in cultivated tracts, groves and gardens in towns; keeps in bevvies of four to seven; forages in forest floors, cultivated fields, in shrubs and grassy meadows, feeding by day and roosting in trees at night; food comprises wild grains, seeds, fruits, cultivated crops and vegetables, and also insects, spiders and scorpions, molluscs and rodents. Wary and shy in the wild, runs swiftly through tangles of shrubs and bushes and finally lifts itself up in the air and once on wings flies fast with care, clearing long distances; breeds from June to October depending on rains; male polygamous in courtship display; the male expands its train into a brilliantly colourful fan and quivers the same before its harem to attract the hen well concealed and lined with sticks, grass, leaves, and debris; clutch consists of three to five eggs, the hen only incubates, incubation period 27-28 days.

Voice and calls: Harsh, non-musical piercing notes 'may-awe' or 'kain-kain-kain-kain'; while courting the male emits a loud short note 'kaon'; when in distress a warning call 'dhank' repeatedly emitted at short intervals.

LITTLE BUSTARD-QUAIL

97. *Turnix sylvatica dussumier* (Temminck)

1828. *Hemipodius Dussumier* Temminck, *pl. col. livr.* 76:454, f.2. Type-locality: Bengale (=Bengal, India).

Local Names: Gulu, Gundrā (Hindi).

Recognition: A very small, rounded plump quail-like bird, with a pointed tail and lacking hind toes; size of the male that of the Spotted Munia (length 150mm). Except for the size sexes alike.

Crown blackish brown with a buffy white stripe running from the forehead to nape; a buffy white line over each eye; back and neck ferruginous, feathers edged with buff; mantle barred rufous and black, central tail-feathers lengthened; underparts whitish with black spots on sides of breast and 'V'-shaped on flanks.

Iris dark brown to reddish brown, bill plumbeous; legs fleshy white.

Distribution: Throughout India including Rajasthan (Jodhpur, Sambhar Lake, Mt. Abu) and Gujarat.

Habits and habitat: Resident and local migrant; infrequently met with, sporadic in arid areas depending on rains; a skulker, when flushed met with singly and does not fly far but settles down soon and can hardly be flushed again, completely matches with its background due to its cryptic colour, affects more grassland than scrub jungles, also found in cultivated tracts; breeding period extends from May to October; nest- a scrape in ground, lined with grass in high grass and standing crop, often grass or leaves bent over the nest to form a canopy; clutch comprises three or four eggs, the female being polyandrous finds mate one after another; laying eggs in more new nests, leaving the responsibility of incubation to the male; incubation period 13-16 days.

Voice and calls: The female produces drumming sounds more or less like the pigeon but more voluminous 'groos-groos...' for a quarter of an hour or so, sometimes throughout the day and night.

INDIAN BUTTON QUAIL

98. *Turnix tanki tanki* Blyth

1843. *Turnix tanki* Blyth, *J. Asiat. Soc. Beng.* 12:180. Type-locality: No locality = Bengal.

Local names: Bharati Bil Bater (Gujarati); Lowwā (Hindi).

Recognition: Very like the Little Bustard-Quail with three toes and darker; size that of the

House Sparrow, female slightly larger, length 150 mm. (male); 175 mm (female).

Male: Less rich in colour than the females; upper plumage greyish brown, cross-barred and vermiculated with black; back dark grey with black spots on wings; chin and throat white; underparts light buff, unbarred but finely spotted with black on the sides of the breast; tail short.

Female: A conspicuous broad orange-rufous half collar at the back of the neck distinguishes it from the male.

Iris white; bill cream white to yellow; legs and feet yellow; claws yellowish buff.

Distribution: Practically throughout India spreading to drier areas of Rajasthan and Gujarat, during the rains.

Habits and habitat: Nomadic, infrequently met within thin forests, grassland, scrub jungles and in cultivated crops of millet, in plains and hilly tracts; found solitary and in pairs, sedentary and skulker, when flushed out with great effort, flies low and for a short distance and drops to the ground to disappear in thick bushes; forages under thickets, scratching to find food which comprises grass weeds, seeds, shoots, cultivated grain, insects specially ants and termites; breeding depends on monsoon, generally from July to October; nests in scraped out shallows in ground in jungles or grassland with a canopy of overhanging foliage; clutch composes three or four eggs; incubation done by the male only, female being polyandrous.

Voice and calls: Challenging booming call emitted by the female like that of the Little Bustard-Quail.

COMMON BUSTARD QUAIL
99. *Turnix suscitator taigoo* (Sykes)
 (Plate VI, Fig 20)

1832. *Hemipodius Taigoo* Sykes, *Proc. Zool. Soc. Lond.* :155. Type-locality: Dukhun (=Deccan).

Local names: Horn Bāter (Gujarati), Gulu, Gundlu, Gundrā, Sālui gundrā (Hindi).

Recognition: A three-toed, barred-breasted little quail with a distinctive pale buff patch on wings, slightly smaller than the Rain Quail (length 150 mm) female larger.

Male: Crown dark brown with feathers parting along the middle of the head; upper plumage dark reddish brown with a greyish tinge, chin and throat white; breast pale buff, barred with black; abdomen brownish buff.

Female: More richly coloured than the cock; chin, throat and middle breast black, sides of breast and flanks barred with black.

Iris white; bill, legs and feet blue-grey.

Distribution: Throughout India including southern Punjab, Rajasthan and Gujarat.

Habits and habitat: Resident, fairly common; affects undergrown in forests, scrubs, grassland, hedges and cultivation, sedentary, found singly or in pairs; a great skulker, flushes with difficulty; flight fast, low straight but never going far, drops into cover of tangled foliage and will not rise a second time; food comprises grass seeds, shoots, weeds, cultivated grain, insects specially ants and termites, breeds with commencement of monsoon rains between July and October; female pugnacious challenging and fighting other females for possessing the male; nest scratched to form a depression on ground in scrubby jungle or in grassland; clutch consists of three or four eggs; male takes the responsibility of incubating the eggs and extends care of the chicks, the female being polyandrous, indifferent towards clutch and care of the brood.

Voice and calls: A loud drumming call and booming note emitted by the female.

COMMON CRANE 100. *Grus grus lilfordi* Sharpe

1894. *Grus lilfordi* Sharpe, *Cat. Bds. Brit. Mus.* 23:250. Type-locality: Jhelum River near Jelalpur, Punjab.

Local names: Kūnj (Gujarati); Kūrunch, Kārch (Hindi).

Recognition: A long necked and long-legged grey bird with curly plumes over the tail; size that of the Grey Lag Goose (height 1400 mm standing); sexes alike.

Forehead and crown thinly covered with black bristles, skin on head dull red; a conspicuous white band originating from behind the eye running to terminate at upper neck; upper and lower plumage slaty grey; primaries blackish; tertiaries elongated to form a bustle concealing the short tail, feathers of tertiaries tipped black.

Iris red, bill green; legs and feet black.

Distribution: Palaearctic, migrates south to India. Found throughout northern and western India including Rajasthan, Kutch, Saurashtra and Gujarat, also extends as far as Andhra in the South and West Bengal in the East.

Habits, and habitat: Very common; migratory; vast skein are observed dropping in different areas in small and large flocks numbering a dozen to several hundreds; affects open fields and cultivations during the day, retiring to margins of pools and river bends; found in semi-desert, desert and drier plains; food comprises green shoots, cultivated cereals, pulses, groundnuts, insects specially locusts and hoppers.

Voice and calls: Sonorous, high-pitched trumpet like notes 'krook-krook' heard from long distance.

SARUS CRANE

101. *Grus antigone antigone* (Linnaeus)

1750. *Ardea Antigone* Linnaeus, *Syst. Nat.*, ed. 10, 1:142. Type-locality: Asia Farther India.

Local names: Sārās (Gujarati); Saras. Desi-sārās (Hindi).

Recognition: A huge bird with a large pointed bill, long bare legs and long neck, in fact the tallest Indian bird, body size that of the vulture, height that of a man (height 1560 mm). Sexes alike.

Head naked, upper neck bright red; crown ashy grey; neck white; wings grey, wing-quills (outer) blackish brown, (inner) grey and white, tertiary wing-feathers elongated and pointed dropping over the primary flight-feathers.

Iris orange; bill black-tipped, rest greenish horny; legs and feet fleshy red.

Distribution: Throughout northern India, east to western Assam, and limited to a hypothetical line drawn from Surat to the Godavari delta in the south. Found in the semi-arid tracts in northwestern India.

Habits and habitat: Resident, common in swamps and marshes; keeps in pairs, sometimes in scattered flocks; affects well-watered areas and cultivated tracts; feeds on grains, shoots, tubers and other vegetable matter, also insects, molluscs, frogs and reptiles; wades in shallows to capture aquatic organisms, viz., fish, crabs and shrimps; generally terrestrial but once on wings, flies strongly but low; breeds in monsoon from July to September when male birds indulge in a spectacular nuptial dance, which includes several acts as bowing of head, arching of head, spreading of wings, springing widely into the air and trumpeting with heads up, chasing each other flapping their wings; the female that gets attracted joins the male and starts duet dance before coition; nests on raised ground in swamp-patch or on islands, both the sexes take part in nest building; nesting material composes reeds, rushes, straw, roots mixed with mud arranged in a circular saucer about a metre in diameter; clutch consists of two eggs; incubation shared by both the partners, incubation period 28 days male keeps more vigilance to the nestlings.

Voice and Calls: A loud trumpet-like sonorous call.

DEMOISELLE CRANE

102. *Anthropoides virgo* (Linnaeus)

1758. *Ardea virgo* Linnaeus, *Syst. Nat.* ed. 10, 1:141. Type-locality: In Oriente = India

Local names: Karkarā, Kunj (Hindi).

Recognition: A small grey crane with a white plume behind each eye and a pedent of black

plumes over the breast. Size almost half of the Sarus Crane (height 760 mm). Sexes alike.

Head and neck black; a narrow white stripe behind the eye terminating in tufts; lower neck bears long pointed black feathers extending to the breast; upper and lower plumage grey; tertiaries near tail well developed.

Iris reddish brown; bill olive, tipped orange; legs and feet black.

Distribution: Palaearctic, migrates all over India including Rajasthan and Gujarat.

Habits and habitat: A winter visitor, starts arriving in autumn and departing by commencement of spring; movement in large flocks, often mixed with the Common Crane (*Grus grus*) in 'V'-shaped formation; frequently met with in agriculture tracts, sometimes congregating in large numbers; affects grassland, standing crop of cereals, groundnut, pulses and other cultivations, also waterholes and riversides; wary when disturbed otherwise fearless under protection; a voracious feeder, food comprises cultivated seeds and grains of cereals, oil-seeds, pulses, groundnut, pulses and tubers, also insects specially grasshoppers.

Voice and calls: Almost that of the Common Crane but call note shorter, high-pitched and melodious 'krook-krook' on flight and while foraging 'responding to each other.

BLUEBREASTED BANDED RAIL 103. *Rallus striatus albiventer* Swainson

1838. *Rallus albiventer* Swainson, *Animals in Menageries*: 337. Type-locality: India.

Local names: Piroji Pān Lāuvā (Gujarati).

Recognition: A large-footed, short-tailed blue-brown wader; size between the quail and partridge (length 270 mm).

Male: Upper plumage dark brown with wavy white bars; chin and throat white; breast bluish grey; head and sides of neck chestnut; undersides (abdomen and flanks) black, barred white.

Female: Upper plumage dull brown, underparts whitish.

Iris reddish; bill horny brown above, reddish below; legs and feet greenish olive.

Distribution: Oriental, found throughout the Indian subcontinent including marshes in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, infrequently met with; locally migratory, movement guided by floods and drought; keeps to reedy patches in swamps; inhabits wet areas where perennial aquatic submerged and floating vegetation with sufficient reeds, rush and bushes provide cover; forages in and around reed-beds during rains keeping to water edge, occasionally jerking its tail; food comprises arthropods, worms, molluscs and weed-seeds.

Voice and calls: Normally silent, at times a sharp deep note 'terricks'

WATER RAIL

104. *Rallus aquaticus korejewi* Zarudny

1905. *Rallus aquaticus korejewi* Zarudny, *Orn. Mber.* 13:209. Type-locality: Northern Turkestan, Buchara, Transcaspia and east Persia.

Local names: None recorded.

Recognition: A long-billed stiff-tailed, long-legged brown, moorhen-like waterbird, with dangling legs in flight; slightly smaller than the Grey Partridge (length 280 mm). Sexes alike.

Upper plumage from forehead to tail olive-brown, feathers streaked black; underparts including sides of head, chin, throat slaty blue; flanks boldly barred black and white.

Iris reddish brown; bill red; legs and feet fleshy pink.

Distribution: Palaearctic, migrates south of its breeding range to northwestern India.

Habits and habitat: An infrequent winter visitor; keeps singly; shy and secretive; affects swampy reeds-beds at the margins of lakes, tanks and pools; a skulker; crepuscular, emerges from dense reed-beds stealthily to forage in water in the manner of the moorhen, trodding on the floating leaves and also walks keeping to the edges of water; food comprises arthropods, snails and worms, also tender leaves and shoots, seeds of aquatic plants.

Voice and calls: Emits a harsh squealing scream.

SPOTTED CRANE

105. *Porzana porzana* Linnaeus

1766. *Rallus Porzana* Linnaeus, *Syst. Nat.* ed. 12, 1:262. Type-locality: Europe = France.

Local names: Tăpkidi Sănto-kukadi (Gujarati); Jhilli (Hindi).

Recognition: A small plump moorhen-like brown bird, with a short bill; slightly larger than the Grey Quail (length 230 mm). Sexes alike.

Crown, sides of head, chin and throat slaty grey; upper plumage dark brown, feathers with conspicuous brownish black centres and edged paler; wings olive-brown, spotted white; breast grey, faintly spotted; underparts whitish; flanks brown barred with white; outer tail-coverts uniform.

Iris brown; base of the culmen orange-red, rest part of the bill yellow and green tipped brown; legs and feet olive green.

Distribution: Palaearctic, migrates south of its breeding range to northern and western India.

Habits and habitat: Migratory, winter visitor; uncommon; frequents marshes specially keeps to the habitat of snipes; an inveterate skulker, when flushed flies a very short distance and skulks in dense swampy cover, bushes of tall grass near the water; food comprises molluscs, aquatic arthropods and seeds. Flies low on migration.

Voice and calls: Silent in wintering areas.

BAILLON'S CRAKE 106. *Porzana pusilla pusilla* (Pallas)

1776. *Rallus pusillus* Pallas, *Reise Russ. Reichs* 3:700. Type-locality: Dauria.

Local names: Baillon-ni-sāpta kukādi (Gujarati); Jhilli (Hindi).

Recognition: A plump wader resembling a small quail; legs long dangling in flight; size that of the Rain Quail (length 190 mm). Sexes alike.

Head and nape olive-brown; supercilium ashy grey, a brown streak runs through eye to ear-coverts; upper plumage brown streaked with black and white; wing-feathers brown, outer web of the first primary conspicuously white; underparts slaty grey; under tailcoverts barred with black and white.

Iris red; bill green without red base; legs and feet brownish grey to greyish green; claws horny brown.

Distribution: Palearctic, migrates in winter to the plains of India including the arid and semiarid tracts of northwest India.

Habits and habitat: Migratory, winter visitor, uncommon; keeps singly; affects marshland with dense growth of bushes and reeds supported by swamps; a lily-trodder as well an expert swimmer; forages in water and among vegetation; food comprises seeds and tender leaves of hydrophytes, also arthropods, molluscs, worms.

Voice and calls: Emits high pitched notes 'crek' followed by low to high pitches 'creks' in succession.

BROWN CRANE 107. *Amaurornis akool akool* (Sykes)

1832. *Rallus Akool* Sykes, *Proc zool. Soc. Lond*: 164. Type-locality: Dukhun = Deccan. southcentral India.

Local names: Nāni Dāvāk, Taphkhiri sāntā-kukādi (Gujarati); Bhurā Jhilli (Hindi).

Recognition: A dark brown, stub-tailed moorhen-like marsh bird; slightly smaller than partridge (length 260 mm). Sexes alike, male slightly larger than the female.

Upper plumage dark olive-brown; head and neck ashy grey with inconspicuous

superculium; chin and throat whitish grey; underparts ashy grey; vent and under tail-coverts brown.

Iris red; bill dark green-brown; legs and feet greyish to plumbeous red.

Distribution: Indian subcontinent, including the wet areas in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, rather uncommon; keeps singly; shy and secretive; affects reed-beds specially along the river banks and large pools and lakes; largely crepuscular; forages in and around reed beds in early morning and late evening; food comprises aquatic as well as terrestrial insects, molluscs, worms seeds of aquatic plants; breeds from May to September; nest-a pad of grass, reed leaves and rushes, erected well-concealed among reeds; clutch consists of four to six eggs; incubation shared by both the sexes.

Voice and calls: A shrill long drawn rattling whistle.

WHITEBREASTED WATERHEN

108. *Amarornis phoenicurus chinensis* (Boddaert)

1783. *Fulica chinensis* Boddaert, *Table Pl. enlum.*: 54. Type-locality: China = Hongkong.

Local names: Dāvāk (Gujarati); Dawak. Dāhāk, Dāuk (Hindi).

Recognition: A dark-coloured, white masked and white-breasted wader with ungainly feet and erect tail, bobbing it up and down; size that of the Grey Partridge (length 425 mm). Sexes alike.

Forehead, foreneck and breast white; crown, hindneck and upper plumage dark slaty grey tinged with olive; flight-feathers blackish brown; a white line along the edge of both the wings; underparts white with sides of the body slaty grey; under tail-coverts rufous; tail slaty grey.

Iris reddish brown; bill green, upper mandible red at base; legs and feet greyish yellow.

Distribution: Oriental, confined to the Indian subcontinent including the wet areas in the northwestern arid and semi-arid tracts.

Habits and habitat: Resident, widely dispersed during monsoon; infrequently met with in swampy areas; affects reed beds, thick vegetation, rushes and hedges with scattered trees standing in or at the water margins; skulker and a fast runner and climbs trees with ease; forages among aquatic vegetation as well in the outskirts of reeds on ground; food comprises aquatic plants, shoots and seeds, also arthropods and molluscs; breeding commence in summer and through monsoon to autumn; Nest-cup-shaped, made of twigs lined with reeds, generally erected on tree-forks overhanging water or on the margin of tanks; clutch consists of five to seven eggs; both sexes share incubation and extend care to the chicks.

Voice and calls: A monotonous loud croak and roaring, repeated call 'ka-wank, ka-wank, ka-wank' or 'kak-kak-kak'

WATER COCK 109. *Gallicrex cinerea* (Gmelin)

1789. *Fulica cinerea* Gmelin, 1789, *Syst. Nat.*, ed. 13, 1 (2):702. Type-locality: China.

Local names: Jāl-mūrgho (Gujarati); Korā, Kāngra (Hindi).

Recognition: A long-legged, long-toed, rail-like waterbird with a horny shield on forehead; size that of the Grey Partridge (length 430 mm). Sexes alike (non-breeding).

Male (breeding): Upper plumage overall blackish; head bears a well developed fleshy horn-like protuberance projecting over the crown (an enlargement of the frontal shield; abdomen white, under tail-coverts buffy white, barred brown.

Female: Upper plumage mottled light and dark brown; frontal shield inconspicuous; underparts pale brown barred with dark brown wavy lines.

Iris red; shield-horn fleshy red and yellow towards tip; legs and feet dull red (breeding male); bill yellowish brown; legs and feet greenish brown (female). (non-breeding male).

Distribution: Oriental, affects well-watered areas in the Indian subcontinent including the arid* and semi-arid tracts of northwestern India.

Habits and habitat: Resident and locally migratory; rare; keeps singly or in pairs; affects grass swamps, well-watered paddy crop fields, reed-beds of rivers, lake and ponds; crepuscular, more active during early morning and late evening, foraging near the edge of grass and takes refuge under cover of reeds or other aquatic vegetation when alarmed; food comprises shoots and seeds of aquatic plants and paddy, also aquatic arthropods, molluscs, worms; male highly pugnacious during breeding season; not recorded to breed in arid areas of Rajasthan and Gujarat.

Voice and calls: Male during breeding period continuously booms 'kok-kok-kok-kok-' and also emits metallic notes 'utum-utum-utum', sometimes a few notes 'kluck-kluck-kluck'

MOORHEN 110. *Gallinula chloropus indica* Blyth

1842. *Gallinula chloropus?* var. *indicus* Blyth, *J. Asiat. Soc. Beng.* 11:887. Type-locality: Calcutta.

Local names: Jāl-kukādi (Gujarati) ; Jāl-mūrghi, Pāni-murghi (Hindi).

*A pair was observed in a freshwater tank near Matapahar, Nagore District, Rajasthan in November 1957 (A.K.M)

Recognition: A slaty grey extraordinary long-footed, rail-like waterbird with a flat rounded red patch at the base of the bill; size more or less that of the Grey Partridge (length 320 mm). Sexes alike. Bobbing action of the head and constant jerk of the tail exhibiting the white of the under tail.

Head and neck blackish grey, upper plumage brownish olive, flight feathers of wings blackish brown finely bordered with white, tail olive-brown, outer tail-feathers black; chin and breast slaty grey, abdomen whitish, under tail-coverts white with a black patch in the centre.

Iris red; frontal shield bright red, base of the bill reddish, rest of the bill greenish yellow; legs greenish yellow red gartered at the joint; feet and toes slaty grey.

Distribution: Oriental, found throughout the Indian subcontinent including the arid and semi-arid tracts in northwestern India.

Habits and habitat: A resident and local migrant; keeps in pairs or in small parties; affects wetland tall reeds, rushes, weeds growing in perennial pools. tanks and reservoirs; not uncommon in its typical habitat; a skulker, flutters to take refuge into reed-cover with slightest disturbance; an expert swimmer and a diver like a duck and takes to wings when necessitates; flight heavy and low just above the water surface but while on migration rises higher and moves faster; food comprises largely vegetable matter, also aquatic insects and other arthropods, molluscs.

Voice and calls: An abrupt loud harsh call 'Prrak' or 'pirrik-perk-perk-perk'

PURPLE MOORHEN

111. *Porphyrio porphyrio poliocephalus* (Latham)

1801. *Gallinula poliocephala* Latham, *Index Orn. Suppl.* 68. Type-locality: India.

Local names: Neel-kikādi (Gujarati) ; Kāim, Kālim, Khārim, Kārmā (Hindi).

Recognition: A long-legged, enormous toed, purplish rail-like bird with a broad frontal casque; size that of the domestic fowl (length 430 mm). Sexes alike except for a small casque in female.

Crown brownish grey, washed with cobalt, bill thick and compressed, cheeks and throat brown tinged with cobalt, nape purplish lilac, upper plumage, abdomen and flanks deep purplish lilac, wings black, tail-feathers black, sides of wings light greenish blue, under tail coverts whitish..

Iris deep red, bill and casque deep red, legs and feet dull red, joints brown.

Distribution: Oriental, found throughout the wetland of the Indian subcontinent including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident as well as a local migrant, moving about with monsoon conditions; not uncommon in perennial water, keeps in small parties of four to eight; tame and confiding in undisturbed condition; affects large swamps, reed-beds, bushes, bullrushes, floating vegetation in large pools and tanks; much of a ground bird with rapid running pace but also an expert reed-dweller, skulking under reed-cover on scenting danger; covers from one cluster of vegetation to another by hops or flaps over the surface of water by clinging to the reeds and twigs; flight short, feeble, clumsy and much laboured; forages in large areas moving in a party at dusk invading nearby crop-fields and cause damage by trampling down the standing crop with its heavy long feet; roosts in trees, tall bushes or in reeds standing in water; food comprises vegetable matter, seed, shoots, tubers, wild as well as cultivated, also arthropods, worms and molluscs, fish and frogs; breeds from May to November; courtship display of the male consists holding the weed in its beak and bowing before the female uttering cackling notes; both the sexes take part in nest-building; nest- a large bowl, made of sedges and rushes, erected on broken and inter-rwoven reed-stalks on the edge or in deeper parts of tanks; clutch consists of three to seven eggs.

Voice and calls: Very noisy, utters cackling grunts and hoarse rippling notes specially during the breeding season; general call, a continuous note 'ka-wank,-kawank-ka-wank' for hours together; normal contact calls among party members, soft 'kak-kak-kak' notes.

COOT

112. *Fulica atra atra* Linnaeus

1758. *Fulica atra* Linnaeus, *Syst. Nat.* ed. 10(1):152. Type-locality: Europe = Sweden.

Local names: ādd, Dasādi (Gujarati); Dasāri, Dasārni, āāri, Kheskul, Thekari (Hindi).

Recognition: A black duck-like waterbird with a pointed bill and a white horny shield; size that of the domestic fowl (Length 420 mm). Sexes alike.

Bill compressed, a frontal shield covering the forehead conspicuously white; head and neck black; upper blackish grey, wings blackish grey edged with white; tail practically absent; underparts slaty black; toes webbed, long and fringed.

Distribution: Palaearctic, widely distributed in the Indian subcontinent including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, migratory in northwest India, a few remain throughout the year reported to be breeding; in winter population greatly augmented by often incredibly large flocks arriving from northern Asia; gregarious; affects large tanks, lakes, reservoirs; skims in open stretches of water by day and move to nearby cultivation in the evening; and expert diver and a swimmer, often flutters to take to wings paltering along the surface of water when disturbed and soon drops and paddles off but once compelled flies after much labour rising high up in air flying in the manner of a duck; food comprises mainly aquatic vegetables diving for

*Dharmakumarsinhji (1954) states 'I have found them breeding in Bhavnagar but as a rule, they are cold weather migrant'.

submerged parts of plants, buds, tender leaves, flowers, fruits, seeds and shoots, cultivated cereals also aquatic arthropods, worms, mollusca, fish and frogs; breeds from July to September in Gujarat; nests among reeds and grass tufts; nest composes of rushes, aquatic grass, reed leaves and tender shoots with a depression erected in compact vegetation growing in water or at the margin of water; clutch consists of six to ten eggs.

GREAT INDIAN BUSTARD
113. *Ardeotis nigriceps* (Vigors)

1831. *Otis nigriceps* Vigors, *Proc. zool. Soc. Lond.* 35. Type-locality: Himalayas = Foothills of NW India.

Local names: Ghorār (Gujarati); Sohun, Gughunbhār, Hukna (Hindi); Gudād (Kutch); Godāān (Marwari); Tuqdār, Gurayan (Punjabi).

Recognition: A tall, stout, bare-legged heavy bird without the hind toe, reminiscence of a young ostrich, size larger than the vulture (length male 1220 mm, height 1000 mm, wing span 2500 mm).

Male: Crown black and crested; neck white with a black gorget on lower breast; upper plumage sandy buff, finely vermiculated with black, faint grey and brownish; underparts white; undercontour-feathers on breast soft silky, pinkish.

Female: Similar to male but smaller, head white pectoral band absent, upper plumage more vermiculated with black.

Iris pale yellow, bill yellowish tipped black, legs and feet yellowish cream to greyish white.

Distribution: Indian region. Greater parts of dry plains including northwestern India.

Habits and habitat: Resident, seasonally nomadic; infrequently met with but under protection in sanctuaries and National parks, number increasing; keeps singly or in flocks of three or four and at times a dozen, affects open desert, semi-desert scrubby country and dry scattered grassland flats; very shy and wary, when alarmed runs at great speed to hide under a bush-cover and squats and freezes. If suspicious runs to take off in air flying in the manner of a vulture but low, for a very long distance; food comprises insects and other arthropods, lizards, snakes, grass seeds, wild berries and cultivated grains, oil seeds; breeds from March to September; cock polygamous; sexual display by male composes lifting of head high up, puffing out the feathers of neck and breast, the neck-sac extended between the legs almost touching the ground; tail erected and thrown on its back; male acquires a harem consisting four to a dozen female; nest a mere scrape in grass field and open waste at the base of shrub or tall grass, sometimes without any cover; clutch consists of a single egg, sometimes two, only the female incubates.

Voice and calls: Emits barking call 'Hook' during breeding period, a deep booming moan.

HOUBARA

114. *Chlamydotis undulata macqueenii* (J.L.Gray)

1832. *Otis Macqueeni* J.E.Gray, in Hardwicke's Ill. Indian Zool. 2(12). pl. 47. Type-locality: *Himalayas = foothills of N.W. India.*

Local names: Houbārā, Tilur (Gujarati), Siārā tiloor (Kutch); Tilor (Marwari); Tiloor, Hobārā (Punjabi).

Recognition: Almost like the Great Indian Bustard but smaller; size that of the large hefty domestic fowl (length, male, 730 mm, height 600 mm); legs long and bare.

Male: Forehead and sides of head sandy; crown white, crested with short black and white plumes, neck bears a frill of black and white feathers running down each side of neck; throat buff and has a tuft of longish feathers overhanging the breast; upper plumage sandy buff finely vermiculated with black; outer five primaries white with distal third black; outer five primaries white with distal third black; lower plumage white; flanks barred black.

Female: Smaller than the male; ruff and plumes less developed.

Iris bright pale straw; bill slaty black; legs and feet pale straw.

Distribution: Palaearctic, winters in northwest India desert areas.

Habits and habitat: A regular migrant; common, occurs during winter; keeps in small parties; affects flat country with scattered grass patches and scrub-bush; fairly shy, much wary when it scents danger, runs fast to hide behind a bush to squat; when hard pressed takes to wings; flight heavy, slow and low with neck outstretched; food comprises largely insects (beetles, ants, locusts, grasshoppers), lizards and snakes, also vegetable matter such as shoots, grain, wild seeds, fruits and leaves of shrubby trees.

Voice and calls: Silent in winter.

LESSER FLORICAN

115. *Sypheotides indica* (J. F. Muller)

1782. *Otis indica* J.F.Muller, *Icon. Anim.* pl. 33. Type-locality: India.

Local names: Khār-mor (Gujarati); Kala-chārāz, Leekh, Tugdār (Hindi); Tiloor (Kutch); Desi Tilor (Marwari).

Recognition: A long-legged, pied and crested bustard-like bird; size that of the domestic hen (length 460 mm), female slightly larger.

Male: (Breeding): Head, neck and underside black, a tuft of narrow ribbon-like spatulated black feathers behind each ear; chin and part of throat white, a white band across the base of the nape, back black, feathers mottled with white and with arrow marks, flightfeathers dark brown, tail white, buff at the base, mottled and barred with black.

Female: Crown black streaked with buff, head and neck finely vermiculated with black, upper plumage black mottled with sandy buff and marked with buff arrows; wings barred with black, flight-feathers dark brown except the outermost, which has ochraceous yellow bands and mottled with black; tail yellowish buff banded with grey.

Iris pale yellow (male), paler (female), bill yellowish, legs dirty white.

Distribution: Indian region including the semi-arid areas in north and west Indian plains (not found in extreme arid-tracts of western Rajasthan* and northern Gujarat).

Habits and habitat: Resident, also locally migratory, movement much depends on rainfall; met with singly in open field, grassy plains, scrubs or standing crop; shy, an expert runner, crouching low under grass cover, moves fast to disappear on scenting danger, when flushed takes to wings and wheels low with rapid wing-beat; food comprises varied insects as mantids, grasshoppers, beetles and bugs also vegetable matter as tender shoots, cultivated grains, wild seeds; breeds with commencement of rains (August-October) in Gujarat and Rajasthan; courtship displayed by sudden springs, one to two meters in air, shooting out from grass cover; both the sexes take part in jumping display but more activities exhibited by the male and during such acts the male utters a guttural croak to attract the attention of the female; the male has a breeding territory which it protects from intruding male rivals; on sighting a female in close quarters within the limits of its territory, the male puffs its head feathers stretches its neck and rests it on its back, wings raised partly and bends its knees, such acts, repeated several times at intervals, till the female gets closure to the male for coition; nests on ground in plain or shallow depression in fields of short grass; clutch consists of three to five eggs, only female incubates.

Voice and calls: Male emits a frog-like croak or a low chuckle, female utters 'peeoo or frog-croak'

PHEASANT-TAILED JACANA 116. *Hydrophasianus chirurgus* (Scopoli)

1786. *Tringa Chirurgus* Scopoli, *Del. Flor. et. Faun. Insubo*, fasc 2:92. Type-locality: Luzon (Philippines).

Local names. Jāl-mānzār (Gujarati), Piko, Pihuyā (Hindi).

Recognition: A rail-like wader with extra-large toes, conspicuous large wings and a sickle-shaped pheasant-tail; size that of the Grey partridge (length 310 mm).

Breeding: Head white, nape yellow, upper plumage black, sides and underwing feathers white mixed with black, upper breast white, lowerparts blackish or chocolate, tail blackish, central tail-feathers long.

*Observed in Pali,(Pali District); Nagaur, (Nagaur district) Nasirabad, Ajmer Road(Ajmer District), in October and November 1959 and in Gondal (Central Saurashtra) in February 1984 (A.K.M).

Non-breeding: Eyebrow white, a golden line runs down the sides of the neck, a black necklace on the upper breast, upper plumage brown, lower plumage and outer tail-feathers white and central tail-feathers brown, wings light brown barred with dark brown and tipped black.

Special features- a strong sharp spur on the bend of the wing and first primary terminating in an attenuated point.

Iris pale yellow; bill bluish (breeding), basal half yellow, rest dark brown (non-breeding); legs and feet pale plumbeous (breeding), dull greenish (non-breeding).

Distribution: Oriental, found all over India including suitable westland habitat in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, also a local migrant: not uncommon during monsoon; keeps in pairs and small groups; affects tanks and lakes having rush and reeds, floating weeds; prefers open water; forages in water or at the water edge also on land in cultivation; food comprises water-plants, nuts, fruits, wild seeds and shoots, cultivated cereals and crop; also aquatic arthropods, worms, molluscs; breeds in rainy season (June-October); males pugnacious during breeding period; female polyandrous; nest- a large circular floating mass made of weeds, rush and reeds, hardly with any cavity or depression, placed among lotus leaf clusters close to the water-edge; clutch consists of four eggs; only male incubates, nurtures and feeds the chicks.

Voice and calls: A sonorous call 'me-e-ou, me-e-ou' repeated several times during breeding season. When suspicious of danger emits a cat-call 'meow' or nasal call 'tewn, tewn'

BRONZEWINGED JACANA 117. *Metopidius indicus* (Latham)

1790. *Parra indica* Latham, *Index Orn.* 2:761. Type-locality: India.

Local names: Kālo jāl-mānjar (Gujarati), Jāl-pipi, Pipi, Kundāi (Hindi).

Recognition: A bronze-backed, short tailed, rail-like bird with enormous toes and claws to walk on floating leaves; size more or less that of the Grey Partridge (length 280 mm). Sexes alike, female slightly larger.

Head, neck and breast black, lower hind-neck glossed with purple, a white stripe over the eye, upper plumage olive-bronze, primaries black, tail-coverts and tail chestnut, underparts and rump dull blackish-brown.

Wing-bend provided with a small tubercular spur; toes greatly elongated, claws long and straight; a lappet at the base of the bill resting against the forehead.

Iris brown; bill greenish yellow, base reddish, tip yellow; forehead lappet red; legs and feet dull green.

Distribution: Oriental, widely distributed in the Indian subcontinent including the wet areas in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, locally migrant; rather uncommon; keeps singly or in pairs; affects jheels, tanks and lakes with reed fringed edges and adequate aquatic submerged and floating vegetation, specially the *Singara* (*Trapa* sp.), water-lily, lotus, and large-leaf water plant on which the jacana walks like rails; flight also rail like with trailing legs; swims with ease half submerged in water; food comprises aquatic plants shoots nuts, also aquatic and terrestrial insects, molluscs; breeds during rains (July-September); nest-made of grass, rushes and weeds in circular pad placed on thick floating vegetation; clutch consists of four or five eggs; although both the sexes share nest-building yet only male incubates the eggs; incubation period about 16 days.

Voice and calls: A harsh grunt or guttural note, sometimes a variety of piping call.

PAINTED SNIPE

118. *Rostratula benghalensis benghalensis* (Linnaeus)

1758. *Rallus benghalensis* Linnaeus, *Syst. Nat.* ed. 10, 1:153. Type-locality: Asia.

Local names: Pān Lāuvā (Gujarati); Rājchahā (Hindi).

Recognition: A clumsy build, resplendently painted bird like the Bustard-Quail with a slightly curved snipe-like long bill and long legs; size more or less of the Grey Quail (length 250 mm). Female larger and brighter than male.

Male: A broad buff band runs from the forehead to the middle of the crown and another behind eye encircling the former band; head and breast greenish grey; upperparts metallic olive-green; back bears a broad buff band on each side; wing-coverts banded as well as spotted; flight-feathers of wings bluish grey, barred with fine wavy black lines and spotted buff on outer webs; upper tail-coverts and tail feathers bluish grey, barred with black and spotted and tipped with buff; chin whitish; lower parts white; sides of breast olive-brown and black.

Female: Rich chestnut-red from head to breast; upperparts dark green or bronze; wings greyish with yellowish round markings; eyes large encircled by a white ring; breast chestnut-red with a conspicuous white girdle; lowerparts white.

Iris brown; bill fleshy brown tipped darker; legs and feet green; claws brown.

Distribution: Oriental*, found throughout India including the wetland in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; locally migratory, movement much depends on monsoon and drought; infrequently met with in marshes, shy and secretive; affects swampy ground of lakes,

*Met with in swampy area in Pali (Pali District) and in the grassy belt along the railway tract between Gudha Railway Station and Kuchman Road at the edge of Sambar Lake (Nagaur District) Nov. 1959 (A.K.M).

pools and water reservoirs resorting to heavy reed-cover, aquatic grasses and vegetation growing in water or in shallows at margins; when flushed, with difficulty it rises with dangling and trailing legs and after a short low flight drops soon to disappear into cover; forages in marshes, sometimes out in cultivated fields, walking slowly in a skulking manner and squatting with a pause to cover when it scents danger; food comprises insects, crustaceans, molluscs and aquatic vegetation; breeding commences in June and continues till October; female polyandrous and it plays major part in courting, calling and challenging rival females thus attracting the attention of the male; nest-saucer-shaped (built by the female), woven completely and placed in depression on ground; the female lays several clutches of eggs; clutch consists of four to six eggs and leaves the responsibility of incubation to the male; incubation, raising the chicks and fending the offspring done by the male only.

Voice and calls: Male emits a metallic long-drawn repeated note 'oook' and female a squaky note.

BLACKWINGED STILT

119. *Himantopus himantopus himantopus* (Linnaeus)

1758. *Charadrius Himantopus* Linnaeus, *Syst. Nat.* ed. 10, 1:151. Type-locality: Southern Europe.

Local names: Gāj-pāon (Gujarati); Gāzpāon, Tinghūs (Hindi).

Recognition: A pied marsh-bird with extra-long, thin legs and straight long bill; size that of the Grey Partridge (length 450 mm; legs 250 mm).

Male (adult in winter): Forehead to upper mantle white; upper plumage and scapulars black with a sheen of metallic green; wings long and pointed; rump and upper tail-coverts white; tail grey-brown underparts white in winter, suffused with rosy tint in summer.

Female (adult in winter): Mantle black; wings sullied with brown.

Iris bright red; bill black; legs and feet rose-red; claws black.

Distribution: Palaearctic-Oriental, found throughout India including the wetland of arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, locally migratory depending upon water availability, in winter population augmented with fresh influx of birds from north; quite common, often found mixed with other waders; gregarious; affects brackish-water pools as well as freshwater, found in extensive mudflats, coastal lagoons, swamps and flooded paddy fields, coastal and inland salt-pans; food comprises aquatic arthropods, (insects, crustacea, water spiders) also worms and snails, small fish and aquatic vegetation; long legs and long bill help to forage in deeper parts of water; breeding commences in April and continues till August; colonial nesting habit; nests in depression in grounds on the dry edge of water; nest-lining composes grass of soft vegetable matter; clutch consists of three to five eggs; both sexes take part in incubation; incubation period, 25-26 days; incubating birds very noisy when disturbed.

Voice and calls: Very noisy during the breeding season, emits harsh notes 'teoo, tee, tee'

AVOCET

120. *Recurvirostra avosetta* Linnaeus

1758. *Recurvirostra Avosetta* Linnaeus, *Syst. Nat.*, ed. 10, 1:151. Type-locality: Italy.

Local names: Ulti-chānch (Gujarati); Kusya chāhā (Hindi).

Recognition: A streamlined, fairly large, pied marshbird with a long beak strongly curved upwards, size slightly larger than the Grey Partridge (length 460 mm). Sexes alike.

Head to nape black; upper plumage alternatively black and white; underparts white; wings long and pointed; scapulars black; secondary wing-feathers white, primaries black with white bases; legs longish and bare, with partially webbed toes.

Iris reddish brown; bill black; legs blue-grey.

Distribution: Palaearctic, migrates south of its breeding range including northwestern India.*

Habits and habitat: A winter migrant, few resident (breeding) in Kutch; keeps in pairs or in small parties; not uncommon in salt-pans, lakes, rivers and seashores; prefers mudflats or shallow waters having perennial aquatic vegetation and animal life in them; forages by wading, ploughing the water, skimming the food from water-surface by sweeping from side to side with slashing movement; a runner as well as a swimmer; food comprises largely brine shrimps (crustaceans) and molluscs, also aquatic insects; so far recorded to breed in Kutch (Gujarat) in summer (April-May); a colonial nester; nests in sandy ground or dried mud; eggs deposited in slight depression; clutch consists of four eggs; both the sexes take part in incubation; incubation period 22-24 days.

Voice and calls: Emits clear high-pitched note 'kloo-it' several times in flight.

STONE CURLEW

121. *Burhinus oedichnemos indicus* (Salvadori)

1865. *Oedichnemos indicus* Salvadori, *Atti Soc. Ital. Sci. Nat. Milano* 8:381. Type-locality: India.

Local names: Chākvā-chākvi (Gujarati); Kārwanāk, Bārsiri (Hindi).

Recognition: A large plover-like, round headed, goggle-eyed bird, with thick bustard-like long legs without the hind-toe; size that of the Rock Pigeon (length 410 mm). Sexes alike.

Upper plumage sandy greyish brown with rufescent-edged feathers and black shaft-stripes;

*Frequently met with in Sambar Lake in winter (A.K.M)

a dark streak through the eye; white streak below and behind eyes; wing long and pointed, blackish-brown with white marks on the primaries; wing-coverts brown with two conspicuous whitish and dark brown bars; the black and white marks on wings distinctive in flight; tail rounded, ashy brown, tipped black and crossed by a subterminal white bar; breast streaked with dark brown; abdomen whitish; under tail-coverts pale rufous.

Iris golden yellow; bill black, base of bill yellow; legs and feet yellow.

Distribution: Palaearctic and Oriental, represented by the subspecies (*indicus*) throughout the Indian subcontinent including the arid and semi-arid tracts in the northwestern India.

Habits and habitat: Resident; sedentary; shy; keeps in pairs or small groups of five or six; terrestrial, runs rapidly on the ground or take short flight, low over the ground but when compelled takes to wings and flies fast; largely crepuscular as well as nocturnal, during the day remains inactive resting under shade; affects dry, sandy and stony terrain, fallow-country, scrub jungles; forages among dry leaves in early morning and evening, confined within its own territorial limits; food comprises largely arthropods (crickets, grasshoppers, beetles, ants, spiders and scorpions) also grains; its protective colouration together with its squatting and still-posture help it to escape notice of its predators; breeds in summer (March to October); no nest built; clutch consists of two eggs, laid on bare stony ground or in waste land at the base of bushes or grass-tufts; both the sexes incubate, one of the partners keeps guard on eggs while the other incubates; chicks and fledglings also have the instinct of freezing and camouflaging to escape from predators; both the parents extend care to chicks and fledglings.

Voice and calls: Somewhat similar to the Curlew, plaintive whistling 'pick-pick-pick-pick', emitted at dusk and dawn and on moonlit-night more during the breeding season, calling to one another from near and far distance.

GREAT STONE PLOVER

122. *Esacus magnirostris recurvirostris* (Cuvier)

1829. *Oedichnemus recurvirostris* Cuvier, *Regne Anim.*, ed. 2, 1:500. Type-locality: Nepal.

Local names: Moto-chăkvā-chăkvi (Gujarati) Bădā Kărwānăk (Hindi).

Recognition: A larger edition of the Stone Curlew with a heavier, laterally compressed bill; plumage uniform in colour; size that of the domestic hen (length 510 mm). Sexes alike.

Upper mandible more or less straight, lower mandible slightly upturned; eyes large; head and face striped dark, spectacled white; upper plumage cement-grey; wing-coverts darker, grey band conspicuous; underparts whitish; black and white patch on primaries conspicuous in flight; tail short.

Iris greenish yellow; base of bill yellow, tips black; legs and feet greenish grey; claws black.

Distribution: Oriental, found throughout the coast of India including the coastal belt and

riverine-flats of Kutch, Saurashtra* and south Gujarat.

Habits and habitat: Resident; not uncommon in suitable habitats; keeps in pairs or in small parties; affects sea-coasts, river sandbanks, stony and gravelly river banks, grassland by the riverside or sea-beach, preferring proximity of water; unless otherwise closely approached, it does not move but once alert crouches and runs on its long legs; largely crepuscular; food comprises aquatic arthropods (crabs, insects, crustaceans as shrimps, prawns) also terrestrial insects, spiders, worms, molluscs, frogs, small lizards, wild seeds; breeding season commences in spring and continues till the end of summer; eggs laid in mere scrapes on soil of shingle bank; clutch consists of a pair of eggs; incubation shared by both the sexes and both extend care to chicks and fledglings.

Voice and calls: A low and soft whistling alarming note when bobbing or running and chatters like a partridge when takes to wings; noisy during breeding period, rival pairs calling to each other.

CREAMCOLOURED COURSER 123. *Cursorius cursor cursor* (Latham)

1787. *Charadrius Cursor* Latham, *Gen. Svn. Bds. Suppl.*, 1:293. Type-locality: Keni (Southeast England).

Local names: Retāl Rana Godhālo (Gujarati); Cheenā bori (Kutch) ; Bālunukri (Hindi).

Recognition: Like the Indian Courser but lacks the chestnut breast and black abdomen; in flight black lining of the wing conspicuous; size that of the Grey Partridge (length 230 mm). Sexes alike.

Crown rufous, ashy grey behind, black and white eye-stripes; upper plumage sandy buff; wings pointed, primaries black-edged, underwings black; tail-feathers sandy buff, tipped white; breast cream-coloured, legs long, slender bare.

Iris brown; bill black; legs and feet creamy white.

Distribution: South Palaearctic, winters in the arid tracts of northwestern India**

Habits and habitat: Migratory, a winter visitor; not uncommon; keeps in small scattered flocks of four to a dozen in sandy tracts. Essentially a bird of the desert; cursorial; stands upright and with least alarm runs fast and takes to low flight for a short distance, but files high

*At Gir National Park, Saurashtra, three birds were observed by the edge of almost a dry rivulet in February 1984 (A.K.M.)

**Observed three birds in Sam in sand-dunes, west of Jaiselmer in January 1983, also in the Little Rann of Kutch in March 1984 (A.K.M.)

up and fast while on migration; food comprises arthropods specially grasshoppers, locusts, beetles, ants also snails and lizards.

Voice and calls: Usually silent, sometimes utters a hoarse note 'hark-hark'

INDIAN COURSER

124. *Cursorius coromandelicus* (Gmelin)

1789. *Charadrius coromandelicus* Gmelin, *Syst. Nat.* ed. 13, 1(2):692. Type-locality: Coromandel Coast (Southeastern India).

Local names: Rānā Godhālo (Gujarati); Nūkri (Hindi).

Recognition: A plover-like, white-legged, tall cursorial bird; size somewhat smaller than the Grey Partridge (length 260 mm). Sexes alike.

Crown chestnut; long white streaks and a black band below or over the eye, extend to meet behind the nape; bill slender, curved and pointed; colour rufous; upper plumage sandy brown; wings narrow, pointed, dark lined, flight feathers black; tail short and square; tail-feathers greyish brown at the base, rest black tipped with white; central tail-feathers sandy brown outer feathers almost white; chin white; breast rufous, abdomen chestnut-white, with a black patch on the upperpart of the abdomen; flanks and under tail-coverts whitish.

Iris dark brown; bill black; legs and feet white.

Distribution: Indian region, patchily distributed throughout India (except wet zones), including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, locally migratory; not uncommon in suitable dry, open stony or barren terrain; keeps in pairs or loose parties of a dozen or more; shy; stands erect when at pause; cursorial, swift on legs, moving in short spurts, flies low to cover short distances and on landing resumes running in spurts, when hard pressed rises high with quick flap moving fast out of the area of danger; forages in ploughed fields and barred wastes; food comprises arthropods chiefly insects (beetles, hoppers, ants) also lizards; breeding commences in March and continues till August; nests on bare ground in scrapes matching to camouflage the eggs with the background; clutch consists of two or three eggs; female only incubates and also tends the chicks and fledglings.

Voice and Calls: A distinctive alarming note on scenting danger, otherwise silent.

WHITETAILED LAPWING

125. *Vanellus leucurus* (Lichtenstein)

1823. *Charadrius leucurus* Lichtenstein, in *Eversmann's Reise von Orenburg nach Buchara*: 137. Type-locality: Between the Kuwan and Jan Daria, Turkestan.

Local names: Sāfed-punchhi Titodi (Gujarati).

Recognition: A slender plover similar to the Yellow-wattled Lapwing but without wattles on the face and the black cap; size that of the Ring Dove (length 280 mm). Sexes alike.

Head and neck pinkish brown extending to back; wings bear black and white bands; lower back and tail white; chin, throat and foreneck ash-grey; breast dark grey; abdomen buff; under tail-coverts pinkish white.

Iris brown or red; bill black; legs and feet yellow.

Distribution: West Asia, migrates to northwestern India, sometimes further East.

Habits and habitat: Migratory, a winter visitor; not uncommon but not abundant; keeps in pairs or in small loose parties associated with other waders; affects marshes, keeping to freshwater lakes and jheels, also inland saltwater lakes; habits more or less of the Yellow-wattled Lapwing; food comprises insects, crustaceans, molluscs.

Voice and calls: Generally silent in winter; at times communicates to other members by its soft whistle 'chee-viz' or 'pi-wick'- more or less that of the Shikra call.

SOCIABLE LAPWING 126. *Vanellus gregarius* (Pallas)

1771. *Charadrius gregarius* Pallas, *Reise Russ. Reichs* 1:456. Type-locality: Volga Jaiku and Samara.

Local names: Mältāvdī Titodī (Gujarati).

Recognition: More or less like the Indian Courser but larger; large white patch on wings and black subterminal tail-band conspicuous in flight; size that of the Grey Partridge (length 330 mm). Sexes alike.

Forehead white or buff; crown brown; a broad white supercilium over each eye meet on hind neck; a black eye-stripe running down to the nape; chin and throat white; upper plumage olive-brown; upper wings black, primaries black, outer secondaries white; breast ash-grey; underparts chestnut and black; abdomen white; tail white with black subterminal band except on the outer tail-feathers.

Iris brown; bill, legs and feet black.

Distribution: Central palaearctic, winters south of its breeding range in the subtropical and tropical regions of south western and southern Asia. In the Indian region found in northwestern India including the arid tracts.

Habits and habitat: Migratory, a winter visitor; fairly common in Rajasthan* but infrequently met with in Gujarat; affects ploughed fields and open fallow land, preferring dry land and also frequents sand-dunes; food comprises largely insects, scorpions, also wild seeds.

Voice and call: Silent in winter.

REDWATTLED LAPWING 127. *Vanellus indicus indicus* (Boddaert)

1783. *Tringa Indica* Boddaert, *Table Pl. enlum.*: 150. Type-locality: Goa (Western Coast of India).

Local names: Titodi (Gujarati); Titeehri, Titāi, Titi, Tiori (Hindi).

Recognition: A black and white, long necked and long-legged plover with a red wattle in front of each eye; size that of the Rock Pigeon (length 330 mm). Sexes alike.

Head, neck, upper mantle and upper breast black; a white line from eye to sides of the neck; mantle bronze-brown; wings bear a broad white bar; primaries black; rump and upper tail-coverts creamy white; tail white with a broad black sub-median band; underparts white.

Iris red to reddish brown; bill red, tipped black; legs and feet yellow.

Distribution: Range from West Asia to eastern India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, common; keeps usually in pairs; affects cultivated tracts and margins of ponds, rain-puddles, tanks, and reservoirs; generally keeps to ground, running a few steps while foraging; seldom flies unless disturbed and if required undertakes strong and sustained flight; very vigilant, warning about intruder denoted by loud screams, repeated for long period; forages in fallowland and cultivations and in dry river or water edges; food comprises insects, molluscs and vegetable matter; breeding season extends from spring through summer to autumn; nests on slightly elevated ground in open country, fallow field and in cultivated land, preferably in vicinity of water; nest- a scrape in the soil, a circular depression encircled with hard clay and gravels; clutch consists of four eggs; incubation period 28 days; (Sambhar Lake, Rajasthan)**; both the sexes incubate and extend care to the chicks.

Voice and calls: A series of loud shrill calls 'did-he-do-it' or a 'pind'

* Observed in Pokhran, Jaisalmer, Sam (Jaisalmer District) in January 1983 and Sambhar Lake, Didwana (Nagaur District) in February 1958. (A.K.M.)

** Eggs laid on 6 and 7th July 1958, chicks hatched on 3-5 August 1958 (A.K.M.)

YELLOW-WATTLED LAPWING
128. *Venellus malabaricus* Boddaert

1783. *Charadrius malabaricus* Boddaert, *Table Pl. enlum*: 53. Type-locality: Malabar coast (ex Daubenton, pl. 880)

Local names: Parsana Titodi (Gujarati); Zirdi (Hindi).

Recognition: Like the Red-wattled Lapwing, distinguishable from it in being smaller, presence of a bright yellow facial-wattle instead of red; throat and breast light brown; tarsus bright yellow and slenderer. Size that of the Grey Partridge (length 270 mm). Sexes alike.

Iris pale yellow; bill black, yellow at the base; legs and feet yellow.

Distribution: Oriental, restricted to the Indian region including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, also locally shifting; common; keeps in small parties of four or five; affects dry and open country, wasteland, away from water; though terrestrial but takes to wings rapidly and flies strongly; forages in wide areas, food comprises largely beetles, grasshoppers, locusts, ants, white-ants, also wild seeds; breeds with the approach of summer from April onwards till July; nest-shallows scraped by the bird encircled by pebbles or dry clay in fallowland or waste gravelly land; clutch consists of four eggs; both sexes incubate.

Voice and calls: A plaintive distress long-drawn call 'de-which-de-which-de-which' uttered several times on scenting danger.

GREY PLOVER
129. *Pluvialis squatarola* (Linnaeus)

1758. *Tringa Squatarola* Linnaeus, *Syst. Nat.*, ed. 10, 1:149. Type-locality: Europe = Sweden.

Local names: Bātānā-titodi (Gujarat); Bādā-bātān (Hindi).

Recognition: A stout plover much like the Golden Plover but larger and paler; black axillaries, whitish rump and tail, and white wing-bar conspicuous in flight; a small hind-toe present; size that of the pigeon (length 310 mm). Sexes alike.

Forehead white, speckled with black; sides of head and neck white streaked with brown; upper plumage uniform brown-grey; upper tail-coverts white, tail white barred with dark brown; breast streaked and spotted with brown; underparts white; flanks streaked with brown.

Iris brown; bill black; legs and feet lead-grey or black.

Distribution: Holarctic, winters almost worldwide, chiefly the seaboard. Found throughout

India including the coastal belt of western India* (Kutch and Saurashtra) also transient to inland waters.

Habits and habitat: Migratory, winter visitor; arrives as early as August and leaves by the end of April; gregarious, keeps in small parties often mixed with other waders; wary with least suspicion takes off; affects sandy sea-shore, mudflat of inland fresh as well as brackish water pools and lakes; forages at water-edge, often wading in water; runs short distances in spurts, stops to pick up tit-bit morsel and again moves quickly to another spot; flight strong and rapid, very agile on wings; food comprises crustaceans, insects, worms and molluscs, occasionally seeds.

Voice and calls: Generally silent; a shrill whistling call 'tluwee, tlee-oo-ee' uttered on wings, also while foraging.

LARGE SAND PLOVER

130. *Charadrius leschenaultii leschenaultii* Lesson

1826. *Charadrius Leschenaultii* Lesson, *Dict. Sci. Nat.*, ed. Levrault, 42:36. Type-locality: Pondicherry, India.

Local names: Retāl-titodi (Gujarati); Bālu-zirreā (Hindi).

Recognition: A courser-like large brown plover with pointed wings, stout bill and a conspicuous narrow whitish bar on wings; size that of the Grey Quail (length 220 mm). Sexes alike.

Forehead fulvous white; supercilium white, a blackish patch around both the eyes; upper plumage drab, dark olive-brown; wings brown; secondaries tipped with white; tail-feathers brown, tipped white; underparts white; breast with a faint brown band across, often broken in the middle.

Iris brown; bill black; legs and feet greenish grey.

Distribution: Central palaeartic, migrates south of its breeding range; a winter visitor to the sea coast of the Indian subcontinent and also transient in inland waters in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory; common at sea coast, infrequent in inland fresh and salt water lakes, and pools; gregarious, keeps in small flocks, sometimes found singly associated with other waders; forages at edges of tidal shores; food comprises crustaceans, insects, molluscs.

Voice and calls: Silent in winter quarters.

*Observed a small flock affecting a swampy pool near Surendranagar (Saurashtra) in Feb. 1984 (A.K.M.)

LITTLE RINGED PLOVER
131. *Charadrius dubius jerdoni* (Legge)

1880. *Aegialitis jerdoni* Legge, *Proc. zool. Soc. Lond.* 39. Type-locality: Ceylon = Sri Lanka and middle India

Local names: Jerdon-ni jini-titodi (Gujarati); zirreā, Merwā (Hindi).

Recognition: The smallest Indian Plover with sharp pointed wings and short pigeon-like bill; head and breast bear black bands a white ring round the neck conspicuous; size that of the House Sparrow (length 170 mm). Sexes alike.

Forehead white; crown dark brown; a black line from forehead through eye to ear coverts; chin and throat white; a broad white collar round the neck; upper plumage brown; flight feathers of wings dark brown; tail brown, central feathers tipped white; a black band on the upper breast, rest of the breast and abdomen white.

Distribution: Throughout the Indian region.

Iris dark brown with a yellow rim; bill black with orange-yellow base of the lower mandible; legs and feet yellowish green.

Habits and habitat: Resident and locally migrant; common; affects margins of lakes, ponds, reservoirs, pools and sandy river beds, also rain water puddles; keeps in pairs or small scattered parties, runs about with quick steps, suddenly halts to pick up food-material; food comprises aquatic as well as terrestrial insects, crustaceans and molluscs; breeds during March and May; nuptial display exhibited in the form of chasing each other tirelessly and calling to one another; nests on ground in dry gravelly or boulderous open areas near water; nest- a scrape in the sand; clutch consists of four eggs; both sexes incubate, incubation period 21 days, both the parents extend care to chicks and fledglings fending them from predators by feigning wing injury, moving away from the nest.

Voice and calls: a plaintive single high-pitched whistle 'pheeoo' emitted in flight.

KENTISH PLOVER
132. *Charadrius alexandrinus alexandrinus* Linnaeus

1758. *Charadrius alexandrinus* Linnaeus, *Syst. Nat.*, ed. 10, 1:150. Type-locality: Egypt.

Local names: Dhongili (Gujarati); Zirriā (Hindi).

Recognition: Like the Little Ringed Plover but lacks the black band on the breast; size that of the House Sparrow (length 170 mm). Winter male and female alike, breeding birds in summer dissimilar.

Male (breeding): Forehead and supercilium white; a black band across forecrown; rest of

the head and nape rufous; hindneck collared white; mantle light sandy brown; wing coverts brown, greater-coverts edged white; underparts white; a blackish patch at sides of breast.

Female and male (non-breeding): Much like the Little Ring Plover in winter; crown dull rufescent; black of forehead and patches at sides of breast replaced by white.

Iris brown; bill black; legs and feet plumbeous grey or dusky.

Distribution: Palaearctic, also found to breed in northwest India, migrates to the rest part of India.

Habits and habitat: Resident; rather uncommon in arid and semi-arid tracts; affects waters in sandy drier areas, sandy beaches, sand-dunes, muddy and sandy plains and inland waters; rest of the habits like that of the Ring Plover; breeds between March and July; nests on the ground in dry sandy soil in sandy river beds or in sandy seashore above the tide line; nest- a shallow depression lined by shell-fragments; clutch consists of two or three eggs; both sexes incubate; incubation period 15-17 days; both the partners extend care to the chicks and fledglings and fend them by lure display, feigning injury by wing-drooping, crouching the ground and stretching out to exhibit the wing as if broken.

Voice and calls: A piping 'pit-eat' emitted from time to time.

PAMIR LESSER SAND PLOVER 133. *Charadrius mongolus atrifrons* Wagler

1829. *Charadrius atrifrons* Wagler, *Isis von Oken*, col. 650. Type-locality: Bengal.

Local names: Nāni Retāl Titodi (Gujarati).

Recognition: Similar to the Little Ringed plover with a stouter bill and absence of the white collar on the hind neck; size more or less that of the Spotted Owlet (length 190 mm). Sexes alike.

Wintering birds, sandy grey-brown above, underparts whitish, those attaining summer plumage before emigration have black and white markings on head.

Iris dark brown; bill black; legs and feet greyish green.

Distribution: Southcentral palaearctic, migrates south of its breeding range. Found all over India including the sea-coast of Kutch and Saurashtra, also inland waters of Rajasthan and Gujarat.

Habits and habitat: Migratory, winter visitor; common on coastal mudflats. generally gets mixed with other waders; runs about in short spurts to forage between tide-marks; flight very swift, low and swerving; food comprises insects, crustaceans, tiny molluscs, worms, also seeds; territorial fight often observed threatening one another and chasing off intruders.

Voice and calls: Generally silent in winter, sometimes emits 'chit-chit' or 'twit-twit'

WHIMBREL

134. *Numenius phaeopus phaeopus* (Linnaeus)

1758. *Scolopax phaeopus* Linnaeus, *Syst. Nat.*, ed. 10, 1:146. Type-locality: Sweden.

Local names: Nāni-khālili (Gujarati); Chhota-goungh, Chhota-gulindā (Hindi).

Recognition: Like the curlew but smaller and a shorter bill; crown bears a median pale white streak and eye-stripe distinct; size more or less that of the Grey Partridge (length 430 mm). Sexes alike.

Crown dark brown with two broad dark stripes and median band white; mantle dark brown with whitish spots; lower back and upper tail-coverts white, barred brown; feathers mottled, fringed paler; tail ash-brown; chin white; throat and breast streaked brown; flanks brown; abdomen whitish streaked faintly with black.

Iris brown; bill dark horny; legs and feet greenish grey.

Distribution: Northwest palaearctic, winters south of its breeding range. Winter visitor to the Indian coastal lines, also inland waters of Rajasthan, Kutch and Saurashtra.

Habits and habitat: Migratory, a regular winter visitor, arriving as early as August and departing by April; very common often gets mixed with flocks of Curlew and Redshank; gregarious; affects mudflats of seashores and tidal creeks, edges of large inland lakes; very swift on wings; forages on exposed mudflats; food comprises crustaceans, mostly crabs and molluscs.

Voice and calls: Rapid tittering whinny short note 'titti-titti-titti-titti' emitted from time to time in flight.

CURLEW

135. *Numenius arquata orientalis* C.L.Brehm

1831. *Numenius orientalis* C.L. Brehm, *Handb. Naturg. Vog. Deutschl.*: 610. Type-locality: East Indies.

Local names: Khālili (Gujarati); Goār, Gough, Bāda gulindā (Hindi).

Recognition: A large dark wading-bird with a long bill, strongly decurved; a white rump conspicuous in flight; size that of a large fat hen (length 580 mm). Sexes alike.

Head, neck, mantle and scapulars black finely streaked with brown; body black barred white on inner webs, inner remiges barred dark brown and white; lower back and upper tail-coverts white; tail short, white, barred blackish brown; underparts whitish buff, streaked with black.

Iris brown; bill dark brown, basal part fleshy brown; legs and feet grey.

Distribution: Central palaeartic, winters south of its breeding range. Found in the Indian subcontinent including the arid tracts in northwestern India and sea-board.

Habits and habitat: Migratory, a winter visitor; keeps in large flocks; gregarious, gets mixed with other waders; very wary and a very strong flier, generally flies close to the surface of water; affects coastal mudflats and inland lakes; food comprises crustaceans, molluscs, insects, worms and mud-skippers, feeding individuals segregate and get scattered to cover a large foraging area and after feeding in the wintering area individuals congregate for return journey in March and take off flying in a long chain, sometimes in 'V' formation.

Voice and calls: A low musical note passing into highly pitched loud calls 'quoi-quoi' and 'cour-li-cour-li' sinking gradually to low note.

BLACKTAILED GODWIT

136. *Limosa limosa limosa* (Linnaeus)

1758. *Scolopax Limosa* Linnaeus, *Syst. Nat.*, ed. 10, 1:147. Type-locality: Sweden.

Local names: Kālikunchh-golera, Lāmbichanch (Gujarati); Gurēra, Gairia, Jangral, Khāg (Hindi)

Recognition: A large brown wader with a long, slender, straight bill and long legs; size, smaller than the curlew (length male, 410 mm, female 500 mm). Sexes alike, female slightly larger.

Head pale brown; upper plumage brown; upper tail-coverts white; wing-bar broad, white, conspicuous in flight; tail white with a subterminal band of dark brown or black; underparts white; upper breast washed with light brown.

Iris dark brown; bill brownish, base yellow-brown; legs and feet greyish black.

Distribution: Palaeartic, winters south of its breeding range. Found almost throughout India including the arid tracts in northwestern India.

Habits and habitat: Migratory, a winter visitor; common, keeps singly or in few pairs, gregarious; flocks of 20-30 birds sometimes met with; flight rapid with quick wing-beats, wheeling; affects freshwater, inland-waters, also brackish pools and lakes that have adequate aquatic vegetation and organisms; wades in shallows and walks briskly with an occasional short spurt, probing the soft ooze with its long bill to its full length; food comprises worms, crustaceans and molluscs.

Voice and call: A loud note 'wick-a-wicka-wicka' on wings' while feeding, emits a monosyllabic 'kuk or kik'

COMMON REDSHANK

137. *Tringa totanus eurhinus* (Oberholser)

1900. *Totanus totanus eurhinus* Oberholser, *Proc. U.S. Nat. Mus.* 22:207. Type-locality: Tso Moriri Lake, Ladakh, India.

Local names: Ratapug (Gujarati); Chhotā-bātām (Hindi).

Recognition: A greyish brown orange-legged, large size sandpiper; size more or less that of the Grey Prtridge (length 280 mm). Sexes alike.

Upperparts brownish, mottled with black; lower back and rump white; throat, breast and underparts whitish spotted and finely streaked with black and brown; secondaries broadly tipped with white forming a prominent white wing bar, most conspicuous in flight; tail white, barred with brown.

Iris brown; bill black, basal portion orange; legs and feet orange; claws black.

Distribution: Central palaeartic, migrates south of its breeding range. Found in India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, a winter visitor; common keeps in scattered parties, mostly associated with other waders, sometimes found solitary; affects largely sea-shores, specially rocky shores, also mud-flats, inland lakes; runs about on edges of water, at times wades in water to forage among sea-weeds, more active with the turn of the tide; food comprises largely tiny molluscs, crustaceans, specially brine shrimps, other small marine organisms, aquatic insects, worms; on least suspicion of a predator or intruder it bobs its head up and down.

Voice and calls: When alarmed emits a loud piping 'tew-tew-tew' just before taking to wings and also in flight.

MARSH SANDPIPER 138. *Tringa stagnatilis* (Bechstein)

1803. *Totanus stagnatilis* Bechstein, *Orn. Taschenb. Deutschl.* 2:292. pl. 29. Type-locality: Germany.

Local names: Gāndāpug Tutvāri (Gujarati).

Recognition: A very slender, long-billed, lanky wader; size that of the snipe (length 250 mm.). Sexes alike.

Forehead, sides of the head, lower back and rump white; upper plumage greyish brown; underparts white; tail narrowly barred with brown.

Iris brown; bill blackish; legs and feet olive-green.

Distribution: Discontinuously distributed, palaeartic, winters south of its breeding range. Found throughout the Indian subcontinent including the arid and semi-arid tracts of northwestern India.

Habits and habitat: A winter migrating bird; infrequently met with between autumn and

spring; keeps in small flocks with other waders; affects sea-board as well as inland waters; forages in green marshy shores, predominantly in freshwater pools, sometimes wading in shallows; food comprises aquatic arthropods, snails and worms.

Voice and calls: Usually keeps silent, at times utters shrill notes 'che-weep' in flight.

GREENSHANK

139. *Tringa nebularia* (Gunnerus)

1767. *Scolopax nebularia* Gunnerus, in *Leam. Beskr. Finm. Lapper*: 251. Type-locality: Trondhjem district, Norway.

Local names: Lilāpug, Timtima (Gujarati); Tāntana, Timtima (Hindi).

Recognition: An enlarged Marsh Sandpiper; size that of the Grey Partridge (Length 360 mm.).

Forehead, lower back, rump and tail white, faintly barred, sides of the foreneck and head greyish; upper plumage dark greyish brown; underplumage white.

Iris brown; bill horny brown tipped black, legs and feet green.

Distribution: Palaearctic, winters south of its breeding range. Winters in the Indian subcontinent including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, appears as early as autumn and leaves by early summer; not uncommon; keeps solitary or in small parties, sometimes in company of the Redshank; affects marshes, freshwater and estuaries; forages in muddy banks and in shallow water; when alarmed bobs head and tail; food comprises molluscs, worms and arthropods.

Voice and calls: Emits soft notes 'tew-tew-tew' in flight.

GREEN SANDPIPER

140. *Tringa ochropus* Linnaeus

1758. *Tringa Ochropus* Linnaeus, *Syst. Nat.*, ed. 10. 1:49. Type-locality: Europe (=Sweden).

Local name: Leeli tutvari (Gujarati); titvari (Hindi).

Recognition: An olive-green wader with a longish slender bill; size more or less that of the snipe (length 240 mm). Sexes alike.

Upper plumage dark hairybrown with olive and bronze-green tinge; head and neck ashy brown; chin white; outer primaries black, axillaries dark blackish, under wing-coverts blackish; rump brown; base of tail white, tail short and stumpy, white, conspicuously barred with dark brown; underparts white; breast and throat finely streaked with brown.

Iris brown; bill duskygreen, tipped black; legs.

Distribution: Palaearctic, breeds in northern Europe and Asia, migrates south of its breeding range. Found in India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, arrives as early as mid-August and departs by the end of March; seen solitary, sometimes keeps in pairs rarely associates with other waders; generally affects inland freshwater, ponds, tanks, lakes, marshes, wading in shallows or running on edges, probing in mud for morsel; feeds solitarily, food comprises aquatic and marsh insects and other arthropods, molluscs, worms; bobbing-habit well developed, demonstrated by raising the head and incessantly waging the tail up and down.

Voice and calls: Rises with a distinctive sharp whistle 'tweet-tweet-weet'

WOOD SANDPIPER 141. *Tringa glareola* Linnaeus

1758. *Tringa Glareola* Linnaeus, *Syst. Nat.*, ed. 10, 1:149. Type-locality: Europa (=Sweden).

Local names: Vāñā Tūtvāri (Gujarati); Chūpkā, Chobāha, Titvāri (Hindi).

Recognition: Almost like the Common Sandpiper distinguishable by having pure white rump and a dark tail barred white; legs extend beyond tail in flight. Size that of the Grey Quail (length 210 mm). Sexes alike.

Upperparts dark olive-brown, inconspicuously spotted and marked with white; a conspicuous whitish supercilium present; axillaries white, underside of wings greyish, breast pale dusky; underparts white.

Iris brown; bill blackish brown; legs and feet olive-green.

Distribution: Palaearctic, breeds in northern Europe and Asia, migrates south of its breeding range. Found all over India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: A winter visitor, arrives in early September and departs by the end of April; gregarious, keeps in small parties, while migrating collects in flocks of a dozen or two, sometimes in greater numbers; affects sandy shores along sea-coast, mudflats of creeks, inland marshes, reedy tanks and ponds, pools and inundated fields, forages in shallows practically immersing the whole length of its legs; food comprises aquatic arthropods, molluscs and worms, sometimes also fish.

Voice and calls: When startled utters short shrill notes 'chiff-chiff-chiff' repeated on wings.

COMMON SANDPIPER
142. *Tringa hypoleucos* Linnaeus

1758. *Tringa hypoleucos* Linnaeus, *Syst. Nat.* ed. 10, 1:149. Type-locality: Europs (=Sweden).

Local names: Sāmānyā tūtvāri; Chūpka (Gujarati); Titvāri, Hāra Chūpka (Hindi).

Recognition: A small sandpiper of the size of the Grey Quail (length 210 mm); sexes alike.

Upperparts olive dark brown with a greenish tinge; head and neck ashy brown; supercilium whitish; wing-bars narrow, white; rump brown; tail brown tipped white, faintly barred with white, outer feathers white; upper breast brownish grey; a broad indistinct band across the breast; underparts white.

Iris dark brown; bill horny brown, base of the bill green; legs and feet greyish green.

Distribution: Holarctic, migrates south of its breeding range. Found throughout India including the arid and semi-arid tracts of northwest India.

Habits and habitat: A winter visitor, arriving early August and departing in summer; keeps solitary, sometimes two or three individuals also seen to forage on margins of water specially flats exposed in receding tide; affects seaboard also pools, lakes, streams and rivers; food comprises aquatic arthropods, molluscs, plant seeds; bobs head and tail, flight fast with intermittent wing-beats, low over water.

Voice and calls: Piping call 'twee-twee-wee-wee'

FANTAIL SNIPE
143. *Gallinago gallinago gallinago* (Linnaeus)

1758. *Scolopax Gallinago* Linnaeus, *Syst. Nat.* ed. 10, 1:147. Type-locality: Europa (=Sweden).

Local names: Garkhod (Gujarati); Chāhā (Hindi).

Recognition: An obliteratingly coloured marsh bird with a long, straight, slender bill; somewhat larger than the Grey Quail (length 270mm). Sexes alike.

Crown black with dark brown double streaks running from forehead to the nape, buffish white bands above eyes run down the nape; upper plumage dark brown, heavily streaked with black, rufous and buff; rump and upper tail-coverts rufous buff marked with black; wing-feathers brown tipped with white; tail black tipped buff, central tail-feathers barred black and cinnamon; breast buff, mottled with brown, underparts white; under tail-coverts banded buff and black.

Iris dark brown; bill blackish brown; legs and feet olive-green.

Distribution: Palaearctic, discontinuously breeds from north-western Europe through Siberia to north-eastern Asia and Kashmir Himalayas. Migrates south of its breeding range. Found throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, a winter visitor; common; affects marshy bogs, grassy, marshy edges of ponds and pools; keeps singly; shy but active at night, early morning and late evening, sluggish during the day and remains concealed under cover of grass and bushes among moist vegetation. On approach to its cover, the bird flushes out of its hide, rising off the ground with an alarm note, flying low, moving jerkily in zig-zags, dropping sharply again to take cover in tufts of grass or rushes, forages at night, also at dusk and dawn, probing in soft ground by its long, slender bill; food comprises tiny molluscs, small worms, insect larvae, etc.

Voice and calls: Alarm note 'pench-pench' as it rises from ground with startles.

JACK SNIPE

144. *Gallinago minima* (BrÜnnich)

1764. *Scolopax Minima* BrÜnnich, *Orn. Boreal*: 49. Type-locality: E. Christianso, Denmark.

Local names: Nāno Garkhod (Gujarati); Chhota Chāhā (Hindi).

Recognition: A smaller edition of the Fantail Snipe with relatively a shorter and stouter bill; size more or less that of the Grey Quail (Length 210 mm). Sexes alike.

Head with two broad buff streaks running from the base of the bill over eye to the nape; crown bears blackish streak; upper plumage pale buff streaked with black and with patches of glossy green; throat and breast mottled buff and brown' underparts white; tail wedged-shape with a dozen pointed feathers, white on the outer-feathers absent.

Iris dark brown; bill pale flesh tipped dark; legs and feet olive-green tinged with blue-grey.

Distribution: Palaearctic, extends from North Europe to East Siberia in Asia, migrates south of its breeding range. Found all over India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, winter visitor, arrives in late October and departs by the end of March; fairly common, keeps solitary, affects marshes, keeps singly; very shy, it gets flushed practically when about to be trodded upon; no alarm call when it rises from cover, flight slower and more or less straight, dropping into dense moist swampy vegetation of reeds, forages in swampy ground probing its bill in mud or soft ground to extract morsel; food comprises mainly worms, molluscs and insects, also seeds of marsh plants.

Voice and call: Usually silent in winter.

TEMMINCK'S STINT

145. *Calidris temminckii* (Leisler)

1812. *Tringa Temminckii* Leisler, *Nachtrage zu Bechstein's Naturg. Deutschl.*: 64. Type-locality: Hanau am Main, Germany.

Local names: Kichadiyo (Gujarati).

Recognition: A diminutive Common Sandpiper; size smaller than the House Sparrow (length 150 mm). Sexes alike.

Upper plumage grey-brown, wing-bars faint; outer tail-feathers white; breast suffused ash-brown; underparts white.

Iris dark brown, bill dark brown; legs and feet olive-green to yellowish.

Distribution: Palaearctic, extends from northern Europe to northern Asia (Siberia), migrating south of its breeding range. Found throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, winter visitor, arrives by October and departs by April; fairly common; gregarious, keeps in mixed flocks of small waders; affects inland marshes, freshwater and seaboard; forages in loose parties on muddy flats; food comprises minute molluscs, crustaceans, insects and worms; quite active and alert, the whole flock takes to wings straight up in air to resettle at a safe distance.

Voice and calls: A whistling 'week, week, week' emitted while taking off and on wings.

LITTLE STINT

146. *Calidris minutus* (Leisler)

1812. *Tringa minuta* Leisler, *Nachtrage zu Bechstein's Naturg. Deutschl.* 74. Type-locality: Hanau am Main, Germany.

Local Names: Pānlowwā (Gujarati); Chhotā pānlowwā, Rūnni (Hindi).

Recognition: Much resembles the Dunlin but smaller; grey or brown above and white below; a faint narrow whitish bar on pointed wing-tips, visible in flight; bill straight; smallest of all waders (length 150mm). Sexes alike.

In summer, upper plumage more black and rufous, winter scaly grey-brown; forehead and supercilium conspicuously white; breast white but faintly streaked; rump and central tail-feathers dark brown, outer smoky brown.

Iris brown, bill plumbous black; legs and feet black.

Distribution: Indian subcontinent including northwest India.

Habits and habitat: Winter visitor, sociable and gregarious, found in mixed flocks of waders; arrives in autumn and departs by spring or early summer; affects mostly sea-coasts, mudflats and salt-pans, also inland water reservoirs, tank-edges, puddles and marshes, flocks spread over after landing and individuals run about in short-spurts to collect morsel; food comprises worms, insect crustaceans and other arthropods, and molluscs; takes off with least suspicion, immediately falls into a flock, turning and twisting, emitting signal calls and soon after a short flight settles down to resume foraging activities.

Voice and calls: Soft musical notes 'with-wit-with' and low pitch 'tr-rr' produced generally in flight.

DUNLIN

147. *Calidris alpinus alpinus* (Linnaeus)

1758. *Tringa alpina* Linnaeus, *Syst. Nat.* ed. 10, 1:149. Type-locality: Lapland.

Local names: Kālopet Kichādiyo (Gujarati).

Recognition: A mouse-brown wader almost like the Little Stint but larger; size that of the Redvented Bulbul (length 190 mm). Sexes alike.

Head greyish brown, crown faintly streaked with dark brown; a faint white supercilium present; bill longer and slightly decurved; upper plumage greyish brown, mottled with dark brown; upper tail-coverts blackish; whitish wing-bar conspicuous in flight; breast ashy-grey streaked with brown; underparts white.

Iris dark brown; bill black; legs and feet black.

Distribution: Circumpolarly holarctic, the nominate subspecies breeds in extreme northern Europe (Tundra belt) and migrates south of its breeding range. Winters in northwest India.

Habits and habitat: Migratory, winter visitor, arrives as early as August and departs by the end of May; common, keeps in large flocks, sometimes with other waders; affects muddy shores and also inland mudflats, brackish as well as freshwater lakes and pools; forages scatterly on mudflats along tide-line, probing in soft mud and sand with its long bill with feverish activities; food comprises aquatic organisms largely crustaceans, worms, insects etc.; when alarmed, takes off in close-packed formation, wheeling and turning to settle at a safer distant flat.

Voice and calls: A long drawn shrill monosyllabic note 'twee' when taking off from ground.

CURLEW SANDPIPER

148. *Calidris testacea* (Pallas)

1764. *Scolopax testacea* Pallas, in *Vroeg's Cat. Adumbr.* 5. Type-locality: Holland.

Local names: Vankichanch (Gujarati).

Recognition: Much like the Curlew in the shape of the bill, stature that of the Dunlin; size, somewhat larger than the Redvented Bulbul (length 200 mm). Sexes alike.

Upper plumage greyish brown; head and face streaked with brown; upper tail-coverts white; rump-patch white; tail brown; white wing-bars conspicuous in flight.

Iris brown; bill black; legs and feet grey or black.

Distribution: Circumpolarly holarctic, breeds in the Arctic circles in North Asia, migrates south of its breeding range in winter in the Indian subcontinent including northwestern India.

Habits and habitat: Migratory, a winter visitor, arrives in early August and departs by the end of April; keeps in large mixed flocks of waders; affects sea-shores, tidal mudflats, backwater, irregularly found in smaller number in inland brackish and freshwater pools (Sambhar Lake, Rajasthan),¹ (Ranjit Sagar, Jamnagar Gujarat)²; scatters on mudflats to forage; food comprises aquatic organisms, viz., molluscs, crustaceans and insects; very active, alert and fast on wings.

Voice and calls: Generally silent in winter.

RUFF AND REEVE 149. *Philomachus pugnax* (Linnaeus)

1758. *Tringa Pugnax* Linnaeus, *Syst. Nat.* ed. 10, 1:148. Type-locality: Southern Sweden.

Local names: Tiliyo (Gujarati), Gehwātā, Bāgbād (Hindi).

Recognition: In winter somewhat like the Redshank but with white oval patch on either side at the base of tails; presence of a narrow white wing-band. Size that of the Grey Quail (length, male 310 mm, female smaller). Sexes apparently indistinguishable in winter.

Upperplumage greyish brown, mottled with black and buff; underparts buff-white; wings brownish black, breast pale buff; tail brown, tipped with white; bill short and straight.

Distribution: Palaearctic, migrates south of its breeding range, wintering in the Indian subcontinent including northwestern India.

Habits and habitat: Migratory, a winter visitor, arrives in September and departs by March; keeps in flocks of up to a dozen or two with other waders, sometimes congregating in large number in Western Rajasthan (Kailana Lake, Jodhpur; Pali water reservoir, Pali, Sambhar Lake, Nagore)³ and in Gujarat (Bhadar Lake, Ranjitsagar)⁴ Banas river in Kutch;⁵ affects

¹Observed in January 1958 (A.K.M) - a solitary bird on edge of the lake.

²Found mixed with other waders in February 1984 (A.K.M.)

³Found in company of other waders in December 1957 (A.K.M.). ** Observed a solitary bird in February 1984(A.K.M). *** A flock of half a dozen appeared on sandy bank in February 1984 (A.K.M.)

⁴Observed a solitary bird in February 1984 (A.K.M)

⁵Afolk of half a dozen appeared on sandy bank in February 1984 (A.K.M).

marshes, tidal mudflats, backwater, fresh and brackish water pools, inundated lowland, rivers; forages energetically in wetland, the whole flock keeps engaged from dusk to dawn; food comprises aquatic as well as terrestrial arthropods, molluscs, worms, berries of marshplants, grass, weed seeds and grain; flight very swift with rapid wing beats.

Voice and calls: Usually silent in winter.

BROWNHEADED GULL
150. *Larus brunnicephalus* Jerdon

1840. *Larus brunnicephalus* Jerdon, *Madras J.Lit & Sci.* 12:225. Type-locality: West coast of Indian peninsula.

Local names: Dhomdo (Gujarati); Dhomrā (Hindi).

Recognition: A large grey-white streamlined bird with a large white patch on primaries of wing; size between the crow and the kite (length 460 mm). Sexes alike.

Whole head greyish white with a faint brown mark behind eye (in winter); upper plumage bluish grey; underparts white; outer primaries black on terminal half with a white subterminal patch on the two outer ones.

Iris pale yellow with a deep orange eye-ring; bill blood-red; legs and feet blood-red.

Distribution: Breeds in central Asia, winters to southern Asia along the shores as well as inland waters of India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Winter migrant; common; gregarious, associates with other gulls and raptors; affects freshwater pools, lakes, rivers, swampy and marshy land, seacoast; a strong powerful flier as well as a swimmer; swoops down to water to pick up food material off the surface; food comprises fish, prawns, insects and slugs, also rubbish.

Voice and calls: A harsh "kraaa" similar to the call of the Jungle Crow.

BLACKHEADED GULL
151. *Larus ridibundus ridibundus* Linnaeus

1766. *Larus ridibundus* Linnaeus, *Syst. Nat.* ed. 12, 1:225. Type-locality: England.

Local names: Kālā Māthāno Dhombo (Gujarati); Dhomrā (Hindi).

Recognition: More or less like the Brownheaded Gull, but with shorter and stouter bill and without the wing-mirror; a dark spot behind the ear conspicuous; size that of the pigeon (length 430 mm). Sexes alike.

Head, neck, upper tail-coverts white; four outer primaries white with black tips; rest of the upper plumage pale blue-grey; underparts white.

Iris dark brown, eye-rim red; bill coral red, tipped black; legs and feet coral red.

Distribution: Palaearctic, breeds in Europe west and central Asia; migrates south of its breeding range. Found throughout the coastal region of India and also in inland waters in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, winter visitor, arrives in September and departs in March; keeps in loosely connected flocks; gregarious, associates with other gulls; not uncommon in jheels and water reservoirs (in Rajasthan Jaisalmer, Pali, Sambhar Lake, Ajmer, Saurashtra-Bhadar Lake, Machhu Lake); most common along the coastline; habits more or less that of the Brownheaded Gull.

Voice and calls: A shrill scream "kree-ah"

WHISKERED TERN

152. *Chlidonias hybrida indica* (Stephens)

1826. *Viralva Indica* Stephens, in *Shaw's Gen. Zool.* 13(1):169. Type-locality: Kanpur, Uttar Pradesh, India.

Local names: Thobhali Dhomdi (Gujarati); Tehari, Gāngācheel, Māchh-lonka, Koorāri (Hindi)

Recognition: A streamlined greyish white bird with a short forked tail, a long pointed wing and short legs. Size that of the pigeon (length 250 mm).

Forehead white, rest of the head streaked with black and white, black more marked on the nape; upper plumage light ashygrey, flight-feathers darker; underparts white.

Iris brown; bill dark red; legs and feet crimson.

Distribution: southern palaearctic and oriental, breeding in Kashmir and northern India within the Indian limits; migrates south of its breeding quarters, wintering in suitable localities all over India including the arid tracts in northwestern India.

Habits and habitat: A passage migrant in winter; gregarious, keeps in large and small flocks; affects fresh and brackish marshes, inundated fields, lakes, jheels and rivers, also coastal belt and salt-pans; courses along the water-stretch back and forth like the swallow, quartering the ground, head directed downwards, suddenly drops down to the surface of water or touches the ground to pick up food-material in the manner of the kingfisher; food comprises fish, tadpoles, crabs, shrimps and insects; rarely alights on water, generally rests on rocks and mudflats.

Voice and calls: Emits a harsh 'kreak, kreak' on wings.

GULLBILLED TERN

153. *Gelochelidon nilotica nilotica* (Gmelin)

1789. *Sterna nilotica* Gmelin, *Syst. Nat.* ed. 13, 1(2):606. Type-locality: Egypt.

Local names: Dhomada-Dhomdi (Gujarati); Nādi-cheel (Hindi).

Recognition: A whitish grey tern with black bill and legs, and a deeply forked tail; size that of the House Crow (length 380mm). Sexes alike.

Non-breeding: Head white with a few dark streaks, a black spot just behind and below the eye; upperparts white with a very light grey wash; underparts white.

Iris black-brown.

Distribution: Palaearctic, winters south of its breeding range. Found almost all over India, inland as well as along coasts including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory; common, gregarious, sometimes found in pairs or in scattered flocks; affects jheels, flooded cultivated fields, lakes, rivers; mostly freshwater inland, largely sea-board, estuaries, creeks, salt-pans; flight strong, wavy and buoyant, also an excellent diver; flocks swoop down to collect food matter; food comprises crabs, crustaceans, insects, fish and frogs.

Voice and calls: Noisy, emits continuous harsh calls 'hik-hik' while flying and feeding.

INDIAN RIVER TERN

154. *Sterna aurantia* J.E. Gray

1831. *Sterna aurantia* J.E. Gray, in *Hardwicke's Ill. Ind. Zool.* 1(6): Pl 69, f 2. Type-locality: India.

Local names: Sāmānyā Dhomdi (Gujarati); Tehāri, Gāngācheel, Māchnloukā, Koorāri (Hindi).

Recognition: A grey and white, black-capped, streamlined bird with long pointed wings, long deeply forked tail; legs short and webbed-toed; size that of the House Crow (length 380-460 mm): Sexes alike.

Summer: Crown and sides of head and nape black glossed with green; a white spot under each eye; upper plumage pale grey; underparts white.

Winter: Crown light grey flecked and streaked with black; upper plumage grey to pale grey; underparts white.

Iris brown; bill deep yellow; legs red.

Distribution: Oriental, found throughout the Indian subcontinent (except Sri Lanka), including well watered areas in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; fairly common wherever wetland exists; keeps singly or in small parties; affects large rivers, also jheels, lakes, reservoirs; a strong flier, flight swift and graceful, with deep continuous wing-beats flies up and down the tank or any water stretch, some 8-10 metres above the water surface, looking for shoal of fish; turns and twists with amazing skill in air, sometimes turning sharply and diving perpendicularly into water to capture its prey with its bill; food comprises largely fish, also crustaceans, aquatic insects; after full meal the bird retires to sandbank or sandy islets, roosting on the ground in the afternoon; breeds in summer (March-May); during breeding period they chase each other; a colonial breeder, occupies sand banks or sandy islets often sharing with other terns, pranticoles and plovers; nest- a small depression scraped in the sand; clutch consists of two or three eggs; both sexes incubate; incubation period 18-19 days.

Voice and calls: A monotonous 'tee-tee' and also a few guttural squeeks; while nesting utters shrill plaintive cries 'tioo-tioo, tee-tee'

BLACKBELLIED TERN 155. *Sterna acuticauda* J.E. Gray.

1831. *Sterna acuticuada* J.E. Gray, in *Hardwicke's Ill. Indian Zool* 1(6): pl. 70, f.3. Type-locality: Kanpur, Uttar Pradesh, India.

Local names: Kālāpetni Dhomdi (Gujarati); Māchhlouka, Kālā-koorāri (Hindi).

Recognition: A small torpedo-shaped black-capped, black-bellied tern with a long deeply forked tail; size that of the Rock Pigeon (length 330 mm). Sexes alike.

Summer: Head and nape black, cheeks, chin and throat white; upper plumage ashy grey; innermost primaries tinged brown, outer frosted and whitish; tail pale grey; neck grey passing to chocolate on upper breast; breast black.

Winter: Forehead white, streaked black; a black patch behind the eye; underparts light greyish white.

Distribution: Oriental, found throughout the Indian subcontinent (except Sri Lanka) including the well watered areas in the arid and semi-arid tracts of the northwestern India.

Habits and habitat: Resident; less common than the River Tern; affects jheels, tanks, river-beds and flooded fields; a very fast flier, speed perhaps the highest of all terns; feeds largely on aquatic insects and crustaceans, also fish; roosts on sandbanks; breeds from March to May; nests usually in mixed colonies of terns in sandy shores of rivers and lakes; nest- a scrape in sand; clutch consists of two to four eggs; both sexes incubate; incubation period 15-16 days; both the parents extend care to chicks.

Voice and calls: Emits occasional shrill call 'krek, krek' in flight.

INDIAN SKIMMER
156. *Rynchops alibicollis* Swainson

1837(1838). *Rynchops alibicollis* Swainson, *Anim. in Meng.* 360. Type-locality: India.

Local names: Jāl-hāl (Gujarati); Pānchirā (Hindi).

Recognition: A pied, tern-like waterbird with long, stout, knife-like curved bill; large pointed wings, short forked-tail and short webbed feet; size that of the Jungle Crow (length 400 mm). Sexes alike, female slightly smaller.

Forehead and sides of face white, neck bears a white collar; crown, back and wings blackish brown; inner flight-feathers tipped white; rump and tail white with a longitudinal dark stripe bisecting the rump and tail; bill curious, mandibles compressed, upper mandible considerably shorter than the lower.

Iris brown; bill deep orange, tipped yellow; legs bright-red.

Distribution: Oriental, keeps to rivers of Upper India mostly, few stray to Peninsular India and arid and semi-arid tracts of northwestern India.*

Habits and habitat: Nomadic; infrequently met with singly or in pairs, sometimes in small parties (4-8) in monsoon and winter affecting rivers and tanks having adequate water level and living organisms in them; flight slow, flapping, backward and forward skimming over the surface of water with its lower mandible dipped in water to plough through, repeating the performance till successful completion of its fishing operation; food comprises fish; congregates in large numbers to rest in sandbanks during the hot part of the day.

Voice and calls: A ceaseless twittering cry when intruded. A yapping sound 'kap, kap'

LARGE PINTAIL SANDGROUSE
157. *Pterocles alchata caudacutus* (S.G. Gmelin)

1774. *Tetrao caudacutus* S.G. Gmelin, *Reisse Russl.* 3:93, pl. 18. Type-locality: Norther Persia.

Local names: Bātādo (Gujarati); Bhāttihār (Hindi); Bhatte (Marwari).

Recognition: A drab sandy coloured dove-like bird with a long pointed tail; size that of the pigeon (length 380 mm).

*Observed a pair at the confluence of rivers Jawai-Jalor January 1959 and three birds Machhu Lake and river, Northwest Saurashtra, February 1984 (A.K.M.)

Male (winter): Head rufous-buff; a prominent narrow black line runs backward from eye; upperparts greenish yellow; tailcoverts barred black and yellow; upper-breast chestnut-banded; breast and abdomen white; central tail-feathers long and pin-pointed.

Female (winter): Upper plumage pinkish grey barred black, yellow and light grey; shoulders whitish, fringed black; throat white with alternate black and buff bars across lower throat.

Distribution: southwestern palaeartic, a bird of the desert terrain, migrating to the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, winter visitor; affects stone, gravelly and sandy desert and scrub country; incredible numbers cover long distances on flight, dropping a little away from water edge for watering; affects large and small tanks, jheels, reservoirs; undertakes watering flights during morning and evening hours; after a short rest in the proximity of the edge of water, it trods down to the bank and wades in shallows, soaking the feathers of the legs and feet and underparts and drink in the manner of a fowl and soon take off to land in the sandy desert ground; forages among shrubs and desert grass; food comprises seeds, grain and leaves of xerophytic plants.

Voice and calls: Very noisy while drinking, producing repeated note 'kra-kra'.

INDIAN SANDGROUSE

158. *Pterocles exustus erlangeri* (Newmann)

1909. *Pterocles exustus erlangeri* Neumann, *Orn. Mber.* 17:154. Type-locality: El Hota, Lahej, southern Arabia.

Local names: Deshi Batādo (Gujarati); Bhāt-teetār, Bhātte (Hindi).

Recognition: A sandy buff sandgrouse with an elongated fine pointed tail, a narrow black band across breast and tarsus fully feathered except the short toes; size more or less of the Spotted Dove (length 280 mm).

Male: Crown, neck and throat ochraceous-buff; shoulders and wings tipped with reddish brown, inner web of secondaries white; central tail-feathers elongated and pointed, brown and tipped black; breast buff; abdomen chocolate-brown or black-brown.

Female: Crown and neck spotted with black; throat ochraceous; upper plumage dull buff, barred dark brown or black; longer primaries dark brown; lower breast isabelline; abdomen barred dark brown and rufous.

Iris dark-brown, circum-orbital lining yellow; bill slaty-plumbeous; claws greyish brown.

Distribution: Southwest palaeartic and oriental regions. Found almost all over the drier areas in India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; common in dry and rocky terrain; affects semi-desert, barren sandy plains, dry fallowland and rock faults; a ground dweller; visits waterholes in flocks,

sometime in large numbers, congregating in hundreds at the waterhole; movement in mornings in fixed hours, also evening trip made if birds feel the necessity of drinking; food comprises wild seeds, grains, sprouting vegetation; breeds from November to May; nests in sandy ground, sometimes in ploughed fields, in sandy shelves in dunes, nest- a scrape on ground lined sparsely with a little grass; clutch consists of two or three eggs; both sexes incubate sitting close and tend the chicks; incubation period 19 days (Jodhpur)*

Voice and calls: Emits repeated double note 'pat-patack' on flight specially while approaching waterholes.

SPOTTED SANDGROUSE
159. *Pterocles senegallus* (Linnaeus)

1771. *Tetrao senegallus* Linnaeus, *Mantissa*: 526. Type-locality: Algeria.

Local names: Wāku-wāku (Gujarati); Chitti-bhātte (Hindi).

Recognition: A sandy-coloured, spotted, pintailed dove-like bird; size that of a pigeon (length 360 mm).

Almost like the Indian Sandgrouse (*Pterocles exustus*) except for the absence of a black band across breast and having axillaries white.

Male: Crown pale pinkish brown; upperplumage sandy grey; upper tail-coverts and rump buff-yellow; central tail-feathers much elongated, tail-pins black; forehead, feathers round eyes, sides of head and nape form a pale bluish grey band; upper throat and cheeks orange; scapulars and wing-coverts spotted, pale buff, brown and yellow; underside, lower throat grey isabelline, abdomen to vent black.

Female: Largely black spotted; upperparts buff spotted and blotched dark brown; chin and throat orange-yellow; upper breast spotted, lower breast and abdomen pale isabelline; abdomen bears a restricted black patch.

Iris brown; orbital skin yellow; bill, legs and feet bluishgrey.

Distribution: Confined to the Palaearctic desert of Africa, extending through southwest Asia to northwest India.

Habits and habitat: An winter migrant; affects dry desc.'ate and rocky terrain; flocks composed of several hundreds congregate at waterholes in water scarce areas; flock movement generally takes place two hours after sunrise and before sunset, all bound for some waterhole; before watering the flock first pitches at some distance from the tank and then after a

*April 1960 (A.K.M.)

reconnaissance-flight settles down at the margin and with short steps birds enter shallow water to drink and quickly move out to disappear from the scene; food comprises hard weed-seeds, insects; roosts in open absolute desert in scattered flocks.

Voice and calls: A double musical call note 'waku-waku' constantly uttered in flight.

IMPERIAL SANDGROUSE
160. *Pterocles orientalis orientalis* (Linnaeus)

1758. *Tetrao orientalis* Linnaeus, *Syst. Nat.* ed. 10, 1:161. Type-locality: In orient (= Anatolia ex Hassel-quist.)

Local names: Sāhi Bātādo (Gujarati); Bādā Bhāttā (Punjabi); Sahi Bhat-titār (Hindi).

Recognition: A grey coloured, stout, black-bellied pigeon-like bird, size that of the Large Indian Parakeet (length 390 mm).

Male (adult): Upperparts mottled and yellow, black and olive black; upper wing-coverts ochre-yellow; quills slaty grey, underside of the wing white; upper throat and cheeks chestnut, lower throat black; upper breast grey with a narrow black bar; abdomen and lower breast black; tail heavily graduated, buff and barred with black; central tail-feathers moderately elongated.

Female (adult): Pale fawn coloured, upperparts barred and blotched with black and buffish yellow; head, neck and upper back purplish grey streaked with black; chin and throat yellowish, spotted black followed by a narrow black and yellow band; lower breast black.

Iris brown, skin round eyes lemon-yellow; bill, legs and feet plumbeous.

Distribution: Southwest palaeartic, migrates to northwest Indian arid region.

Habits and habitat: A regular winter visitor, large flocks often met with in the vicinity of water-holes; morning and evening flocking to water-holes from far and near distances at fixed hours, sometimes congregating in hundreds, a regular practice, till the birds stay in their wintering areas; birds fill in their crop and wet their breast and belly by wading in shallow water at margins and take off from water almost vertically; while congregating before drink at the water-hole flocks arriving from different directions produce much noise till they take off and disappear; flight very powerful; roosts in sandy and rocky terrain; food comprises grass and weed-seeds and shoots of wild plants, sometimes also cultivated grains and pods.

Voice and calls: A chuckling note 'churruh-churruh' in flight as well as while landing and taking off.

*Exceptionally large congregation of a thousand or more observed in Gajner (Bikaner, Rajasthan) in a pool of water in January 1959 (A.K.M.)

PAINTED SANGROUSE
161. *Pterocles indicus indicus* (Gmelin)

1789. *Tetrao indicus* J.F. Gmelin, *Syst. Nat.*, ed. 10, 1(2):755. Type-locality: Coromandel Coast, southeastern India.

Local names: Rāngeet Bātādo (Gujarati); Pāhāri Bhāt-titār (Hindi); Rangli Bhatte (Marwari).

Recognition: A dove-like bird with close-barred plumage and two dark pectoral bands present in the male; tail without pin-tail feathers; size more or less that of the Spotted Dove (length 270 mm).

Male (adult): Conspicuously coloured than the female; chin and throat buff followed by broad bands of chestnut, buff and black; crown white intercepted by a black band across; lowerparts barred finely with black.

Female (adult): Crown reddish buff spotted with buff; upper plumage chestnut barred with brown; lower plumage white barred with black.

Iris dark brown, a sage green ring round the eye; bill orange-brown; legs and feet dingy yellowish green.

Distribution: Oriental, found in drier parts of India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; fairly common; keeps in flocks of a dozen or more sometimes in hundreds congregating at waterholes; affects dry broken terrain covered by scrubs and grass, also open fields; waters in early morning and late evening hours in tanks, pools and rivers; flies low but fast, sometimes getting mixed with other sandgrouses; food comprises wild seeds, berries, cultivated grains and green shoots; breeds in winter and spring extending sometimes to summer (December-May); nests in ground among boulders and rocks and sand-shelves in permanent sand-dunes; eggs laid in scraped depressions; clutch consists of two or three eggs; both sexes incubate.

Voice and calls: Normally silent; in flight calls 'yek-yek' and while conferring at water-holes, communicate to one another.

SOUTHERN GREEN PIGEON
162. *Treron phoenicoptera chorigaster* (Blyth)

1843. *Vinago chorigaster* Blyth, *J. Asiat. Soc. Beng.* 12(1):167. Type-locality: No locality = Indian Peninsula.

Local names: Hāriyāl (Gujarati); Hāriāl (Hindi).

Recognition: A stout heavy-built green pigeon; size that of the Rock Pigeon (length 330 mm). Sexes alike.

Head, neck and upper breast greenish yellow; upper plumage olive-green, a lilac patch on shoulder; lower breast and abdomen yellow; under tail-coverts dull chestnut; wings black edged with yellow, a conspicuous yellow band across the quills; basal half of tail-feathers yellowish green, terminal half dove-grey.

Iris blue, circled by pink; bill swollen at the base, coloured green, rest french-grey.

Distribution: Oriental, found throughout the Peninsular India including the dry deciduous forest areas of Gujarat and Rajasthan.

Habits and habitat: Resident; common in mixed forest associated with *Ficus* trees. Arboreal, sluggish, generally met with in flocks of half a dozen to a dozen; flight strong and fast; food comprises drupes, berries and figs; affects largely banyan and peepul in morning, afternoon and also in evening camouflaging among green leaves, freezing when suspicious; breeds from March to June; nest-platforms made of twigs erected in trees, clutch consists of two eggs; both the sexes share in nest-building, incubation and care of the chicks.

Voice and calls: A modulated soft and loud rolling whistle.

BLUE ROCK PIGEON 163. *Colomba livia intermedia* Strickland

1844. *Columba intermedia* Strickland, *Ann Mag. nat. Hist.* 13:39. Type-locality: India = (Calcutta.)

Local names: Parevun, Kābutār (Gujarat); Kābutār (Hindi).

Recognition: A slaty-grey bird with two distinct black wing-bars; size, somewhat smaller than the House Crow (length 330 mm). Sexes alike.

General plumage slaty and bluish grey; neck glossed all around with metallic green and purple, extending to the upper breast; back dark grey; rump distinctly darker than the back; tall short, square, outer tail-feathers blackish tips; wings long and pointed, under wing-feathers very pale grey; base of the bill swollen, nostrils narrow, obliquely set.

Iris brownish orange; bill black; legs and feet crimson-red.

Distribution: Southwest palaeartic, oriental and north ethiopian regions. In India spread all-over including the arid and semi-arid tracts in northwestern India.

Habits and habitat: Resident, very common most familiar both in town and countryside: gregarious, keeps in flocks congregating in large numbers for foraging in promising areas of food supply, shelter and breeding: effects rocks and cliffs, village huts, buildings in urban areas, all sacred and religious buildings and monuments: food comprises largely dry seeds and grains, harvested millets, newly sprouting vegetables and seedlings of pulses and cereals, etc.; breeds all the year round, in western Rajasthan and northern Gujarat, prefers the autumn season: in courtship the male puffs out its breast and circles round the female caressing each other from time to time, nesting sites, ledges or inter-brick gaps in deserted wells, shelves and cornices of old buildings and forts, ramparts of forts, holes under cliffs in rocks and hills and other sites

of convenience where disturbances are least: nests on platform made of twigs, stalks of neem, feathers and rubbish: both sexes share nest building and incubation: period 16-17 days: clutch consists of two eggs: both the parents tend the chicks.

Voice and calls: Utters a deep call 'gootr-gooo, gootr-go'

EASTERN STOCK PIGEON 164. *Columba eversmanni* Bonaparte

1856. *Columba eversmanni* Bonaparte, *Compt. Rend. Acad. Sci. Paris* 43:838. Type-locality: Western and central Asia.

Local names: Nāno Parevun (Gujarat); Kamar-kular, Pāhāri-kābutār (Hindi).

Recognition: Almost like the Blue Rock-Pigeon but with a shorter tail and absense of double bar on wings, also smaller in size (length 300 mm). Sexes alike.

Head lilac, sides of throat and hind neck metallic green; upper plumage dark grey; upper tail-converts ashy grey; breast lilac; underparts ashy grey; tail dark grey, terminal third blackish with a pale-grey band across the outer feather.

Iris light yellow to golden yellow; bare skin round eye pale yellow; bill light green slaty at the base; legs and feet mauve-pink.

Distribution: Palaearctic, migrates south of its breeding range. In India found in drier parts of north, west and central India, including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Winter visitor; uncommon; keeps in small flocks, sometimes congregating in large numbers; affects farm crop and fruiting trees; roosts in groves and gardens nearabout cultivation or in remote village, green patches in dry desolate areas (Mohangarh, W. Rajasthan)* flight fast with twists and turns; food comprises sown wheat, millet, gram also such items after harvest.

Voice and calls: No record from India.

INDIA RING DOVE 165. *Streptopelia decaocto decaocto* (Frivaldsky)

1838.(1834-36) *Columba risoria* Linnaeus, var. *decaocto* Frivaldsky, *K. Magyar Tudos Tarsasag Evkonyvo*, 3:183, pl.8. Type-locality: Turkey.

Local names: Dhol (Gujarati); Pārki, Pānduk (Hindi).

*Observed some six birds in November 1959 (A.K.M.)

Recognition: A pale grey and brown-black dove, somewhat smaller than the Rock Pigeon (length 320 mm). Sexes alike.

Upper plumage light brown, wings ashy grey; head and neck grey with lilac wash; breast pale lilac; abdomen grey; under tail-coverts slaty grey, central tail-feathers light brown, rest blackish brown with broad white tips.

Iris crimson, eyelid-edge red, rest whitish; bill black; legs and feet pink-red; claws horny black.

Distribution: Palaearctic, oriental and north ethiopian regions. Found throughout the Indian subcontinent including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Commonest of all doves; resident, locally migratory guided mainly by food-factor; sedentary; keeps in pairs but small parties to large flocks formed specially while retiring to thorny bushes at dusk and at dawn when it goes for foraging; effects areas with sparse growth of trees having shrubs, bushes, hedges, also in open country with cultivation, in and around road sides, villages and towns, avoids moist and wet zones; food comprises weeds and cultivated seeds, grains, green sprouts also swallows grits; breeding period ill-defined, breeds almost throughout the year except the bitter cold period, in Rajasthan and Gujarat generally in April and May; nests made of tiny or small sticks in the form of platform; placed on thorny bushes and trees not very high up from the ground; both sexes share nest-building; clutch consists of two eggs; both partners share incubation.

Voice and calls: A soft note emitted 'dukkuoo-dukkuoo-dook' repeated several times.

RED TURTLE DOVE

166. *Streptopelia tranquebarica tranquebarica* (Hermann)

1804. *Columba tranquebarica* Hermann Obs. Zool: 200. Type-locality: Tranquebaria, India.

Local names: Lotanā Holi (Gujarati); Seroti, fākthā, Girwi-fākhtā (Hindi).

Recognition: Almost like the Ring Dove but smaller (length 230 mm).

Male (adult): Upper plumage vinous red; head, lower back and rump dark ashy to slaty grey; a black collar round the hind neck; wings dark grey and black, white at the ends; lower plumage vinous-red; under tail-coverts white.

Female: Like a mini Ring Dove; upper plumage brown; head grey; breast light brown; tail and collar as in male.

Iris dark brown, rim around plumbeous; bill black; legs and feet dull red.

Distribution: Oriental, occurs throughout India except wet-parts, found in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident: common, keeps usually in pairs, sometimes male found in

sizable flocks; affects scrubby country, village environs and countryside; avoids both extreme climatic conditions of humidity and aridity; a swift flier, almost like the sandgrouse, when disturbed flies straight rising up in the air to disappear in no time; a ground-feeder, food comprises wild and cultivated seeds and fallen grain; breeds practically throughout the year but prefers summer to winter; nests in trees not very high from the ground; nest made of grass, dry twigs and sticks erected as platform in shrubby and thorny trees; clutch consists of two eggs; both the sexes share nest-building, incubation and tending of the chicks.

Voice and calls: Emits a soft but loud note "groo-gurr, groo-gur' repeated several times.

LITTLE BROWN DOVE

167. *Streptopelia senegalensis cambayensis* (Gmelin)

1789. *Columba cambayensis* Gmelin, *Syst. Nat.* ed. 13, 1(2):779. Type-locality: Cambaya i.e. Gulf of Cambay, northwest India.

Local names: Khumari (Gujarati), Chotā-fākhta, Pārki, Tortrā-fakhtā, Pānduk (Hindi).

Recognition: A dainty little brown dove having a black collar; size, little larger than the Myna (length 2700 mm). Sexes alike.

Head, neck and breast vinous-pink; chin paler; on either side of the neck a gorget of black patch squarely spotted with ferruginous; upper plumage greenish brown; wing-shoulders bear ashy patches; abdomen and under tail-converts white; tail graduated and long, central tail-feathers black-brown, outer with broad white terminals.

Iris reddish brown; bill black; legs and feet dull crimson.

Distribution: Practically throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, locally migratory: fairly common, seen in pairs or in loose flocks; affects dry low hilly tracts, broken country and light bush jungle, open fallow and cultivated lands; not shy, moves freely trodding on foot while foraging in fields and in and around human habitation; flight swift and strong; food comprises all sorts of seeds, grain and green shoots; breeds almost throughout the year but majority between October and April: nest-a filmy platform made of slender twigs, rootlets and stems, placed on thorny bushes, sometimes within easy reach of human hands; clutch consists of one to three eggs; both sexes share incubation and tend the chicks.

Voice and calls: Emits rapid repeated notes 'coo-cru-do-do'

ROSERINGED PARAKEET

168. *Psittacula krameri borealis* Neumann

1915. *Psittacula krameri borealis* Neumann, *Orn. Mber.* 23:178. Type-locality: Assam (India).

Local names: Popat, Sudo (Gujarati): Totā, Lybār totā (Hindi).

Recognition: A green, massive hooked red-billed bird with a long pointed-tail; size that of the common Myna minus the tail (length 420 mm).

Male: A rose-pink and black collar; a black-band from the base of the bill to the collar; a fine black line from the nostril to the eye; upper plumage bright green; lower plumage yellowish green, tail-feathers green, base of the medium feathers bluish grey, remainder green with yellow inner webs, tipped yellow.

Female: An indistinct emerald-green ring replacing the red collar of the nape of the male. Rest of the plumage as in the male; bill not so brightly coloured.

Iris light yellow; bill coral-red lower mandible blackish; legs and feet dusky green.

Distribution: Oriental, Upper India from Punjab, Rajasthan and Gujarat in the West to Assam in the East and as far as 20° in the South.

Habits and habitat: Resident, very common in plains and hilly terrain including the semi-arid tracts but less frequent in arid zone; keeps in pairs to large flocks; affects light deciduous forests, groves, garden; arboreal and an expert climber, climbing with the help of its zygodactyle feet, long tail and mobile upper beak; flight swift and straight frequently turns to circle to gain height in the course of flight; falls to cultivated standing crop as well as fruits in orchards, damaging more than consuming; roosts in evenings in some well-foliaged tree arriving in flocks to congregate in large numbers, often sharing with other birds; food comprises cereals, legumes, berries and other fruits; breeds from January to June; nests either in the natural holes in trees or holes excavated by birds, also utilizes holes in walls of old buildings; no nest made, debris in holes serve as lining; clutch composes three to five eggs; female only incubates, nestlings nurtured by both the parents.

Voice and calls: Harsh, shrill screaming notes.

BLOSSOMHEADED PARAKEET

169. *Psittacula cyanocephala bengalensis* Forster

1781. *Psittacus benghalensis* Forster, in Pennant's *Indian Zool.* 40. Type-locality: Bengal: restricted to Calcutta.

Local names: Tui (Gujarati): Desi Tuiya, Lālsirā Totā (Hindi).

Recognition: A small slender-built, long-tailed red or bluish grey-capped parakeet; size that of the myna minus the tail (length 360 mm).

Male: Head bluish red rather like red plum upper plumage yellowish green; a prominent narrow black collar round the neck, quills green; a deep red patch on wing-coverts; central tail-feathers largely yellow; lower plumage conspicuously yellowish green.

Female: Head bluish or ashy grey, like a blue-plum: a yellow band around the neck; paler below; red patch on shoulder absent.

Iris yellowish white; upper mandible orange-yellow, lower blackish, legs and feet dull green.

Distribution: Oriental, practically throughout Upper India from northwestern India through Punjab, Rajasthan, Gujarat to West Bengal in the East and to 20 degree North. lat. in the South, ascending the Himalayas in the North up to 1500 m. In the semi-arid tracts of western India it has been recorded from Sambhar Lake and Mt. Abu (Rajasthan), and in the Gir and Barda Hills in Saurashtra (Gujarat).

Habits and habitat: Resident, locally migratory, inhabits deciduous forested areas, preferably hilly terrain; keeps in pairs or small parties of five to a dozen; arboreal, occupies top branches of trees; flight strong and swift and with excellent flight manoeuvres through thick forest; food comprises largely wild fruits, flowers, buds, sometimes cultivated crop and orchards near forest fringes or in forest clearings; breeding period chiefly from December to April; nests in natural hollows of trees, or old nests of woodpecker and barbets or both the sexes laboriously chisel out a hole in a bough or trunk; clutch consists of 4-5 eggs, female only incubates and takes care of chicks.

Voice and calls: Soft musical interrogative note 'tool' uttered in flight.

PIED CRESTED CUCKOO

170. *Clamator jacobinus serratus* (Sparmann)

1786. *Clamator serratus* Sparmann, *Mus. Carls., fasc. 1* no. 3 and pl. Type-locality:-Cape Peninsula, Cape Province, South Africa.

Local names: Motido (Gujarat): Pāpiyā, Kālā Chātāk (Hindi).

Recognition: A pied bulbul-featured bird with a conspicuous crest; size that of the myna but with a much longer tail (length 330 mm). Sexes alike.

Crown bears a long, pointed, black crest; upper plumage black, wings black with a roundish white patch; tail graduated, black and tipped white; lower plumage white. Iris brown, bill black, legs and feet slaty grey to leaden blue.

Distribution: Ethiopian-Oriental, found throughout the northwestern to eastern India (including the plains and hills of Rajasthan, Gujarat, Saurashtra and Kutch) and limited to 18 degree north lat. in the South.

Habits and habitat: A migratory bird believed to come from Africa with the advent of monsoon (June-July) to breed in India; keeps singly or in pairs, sometimes in parties of 5-6, frequently wooded and well watered country, groves and gardens, deciduous as well as dry deciduous forests; largely arboreal, occupies top branches of trees, also descends to bushes, shrubs and even to the ground for foraging; food comprises mostly insects viz., lepidoptera larvae, bugs, beetles, termites, ants, hoppers, spiders, terrestrial molluscs, etc. bold enough to approach other breeding birds to challenge; often seen chasing each other among themselves

and calling noisely, evidently the courting flight; breeding commences from June till the end of monsoon coordinated with breeding of various species of babblers, it being a parasitic nester, affects nests of babblers, mostly the Common Babbler (*Turdoides caudatus*) that nests in stunted thorny bushes growing in broken country in dry regions.

Voice and calls: A loud, plaintive, metallic call- 'piu.. piu.. pee-pee-pee-piu'

COMMON HAWK-CUCKOO 171. *Cuculus varius varius* Vahl

1797. *Cuculus varius* Vahl, *Skřiv. Naturhist. Selsk.*, Khobenharn 4(1):60. Type-locality: Tranquebar, Tamil Nadu.

Local names: Būppāoyo (Gujarati): Kāpāk, Upāk, Pāpiyā (Hindi).

Recognition: A superficially hawk-like cuckoo with a slender bill and short legs; size that of the Blue Jay (length 340 mm). Sexes alike.

Upper plumage ashy grey; nape brown; wings sharply pointed, and brown, quills broadly barred with white on their inner webs; tail grey, broadly barred with black and white and tipped rufescent; chin and throat white; breast rufous mixed with pale ash; lower breast abdomen and flanks rufous barred with grey and brown.

Iris yellowish buff with a lemon-yellow rim round the eye; bill cinnabar-green; legs and feet chrome-yellow.

Distribution: Oriental, found throughout the Indian subcontinent, including Punjab, Rajasthan, Gujarat, Saurashtra and Kutch.

Habits and habitat: Resident as well as locally migratory; common seen singly or in pairs affects well wooded country, groves, gardens and forests, keeping to well-foliaged trees; a low flier, entirely arboreal; food comprises insects, specially the hairy caterpillars grasshoppers gryllids, phasmids, bugs beetles, ants and termites, also fruits, berries, buds and green leaves; breeds during monsoon (June-August), a parasitic nester, depositing its eggs in the nests of babblers viz., the Common Babbler (*Turdoides caudatus*), Jungle Babbler (*Turdoides striatus*), Spotted Babbler (*Turdoides malcolmi*), remarkable for its plaintive, monotonous high-pitched calls heard day and night during its breeding period, in winter keeps silent.

Voice and calls: A whirling ascending trill- 'papeeha-papeeha-papeeha' or 'brain fever-brain fever-brain fever' uttered again and again proving itself a nuisance.

CUCKOO 172. *Cuculus canorus canorus* Linnaeus

1758. *Cuculus canorus* Linnaeus, *Syst. Nat.*, ed. 10, 1:110. Type-locality: Europe (= Sweden).

Local names: Pārdeshi Kūkūnath (Gujarati): Phūphū, Pārdeshi-koyel (Hindi).

Recognition: A Sparrow-Hawk-like superficially but with more pointed wings; size that of the Blue Jay (length 330 mm).

Male: Upper plumage slaty blue-grey; wings brown, inner-webs of quills barred white; tail blackish brown, spotted and tipped white, long and graduated; chin, throat and ear-coverts ash-grey; lower plumage white, closely barred with dark brown and black; under tail coverts white.

Iris yellow; bill horny brown; legs and feet wax-yellow.

Female: Overall brown; a buffy brown breast-band; lower plumage tinged with rufous, lower throat and upper breast buff and brown.

Hepatic variety in female not uncommon which reddish or barred chestnut with blackish brown, closely resembles the plumage of the Kestrel.

Distribution: Palaearctic, visiting the tropical parts of Indian peninsula including Rajasthan (Mt. Abu), and Gujarat in its non-breeding season.

Habits and habitat: A passage migrant in August, remaining till November in the arid and semi-arid regions of western India; arboreal, found singly; common in autumn when fairly large numbers are noticeable; silently moving through light deciduous forest and thickets and edges of scrub jungles; food comprises insects, specially the hairy caterpillars.

Voice and calls: Not-recorded in western India.

WESTERN SIRKEER CUCKOO 173. *Taccocua leschenaultii sirkee* (J.E.Gray)

1831. *Centropus sirkee* J.E. Gray, in Hardwicke's Ill. *Indian Zool.* 1(6). pl. 28. Type-locality: Cawnpore(= Kanpur), Uttar Pradesh.

Local names: Sirkeer or Khāki Ghovāro (Gujarati): Jānglitotā (Hindi).

Recognition: A heavy-tailed spiny olive-brown cuckoo much like the Crow Pheasant; size more or less that of the House Crow (length 420-440 mm). Sexes alike.

Upper plumage olive-brown, wings stout and rounded; head, neck, upper back and breast-feathers have fine glistening dark brown shaft streaks; shafts of the fore head feathers projecting; bill stout, curved and sharply hooked; eyelashes black with white bases, coarse, bristly, and curved; outer tail-feathers black, tipped white, long, broad and graduated; chin, throat and breast olive-brown, rest of the lower plumage more reddish brown; legs stout with short toes two in front and two behind.

Iris brown to reddish brown; bill cherry-red, yellow at the tip; legs and feet plumbeous.

Distribution: Northern and western India limited southwards to 22° N lat., including Gujarat and Rajasthan.

Habits and habitat: Resident, not uncommon, terrestrial, keeps singly or in pairs, a skulker; affects dry and semi-deciduous forests, thorny scrubland spread over the broken country and sandy desert; stalks about the ground foraging among dry leaves and undergrowth, runs well to escape, reluctant to fly unless hard pressed; at times perches on low bushes or leafless boughs; food comprises largely insects, spiders, small lizards and snakes, mice fruits, berries and seeds; breeding period chiefly June to August; nest-saucer-shaped made of twigs and grass placed at low heights in cactus or thick shrubs; clutch consists of a pair of eggs; both the sexes incubate.

Voice and calls: Normally silent except while courting, when clicking sounds 'kek-kek-kek-krek-krek-krek' produced like the shriek of the Roseringed Parakeet.

SOUTHERN CROW-PHEASANT

174. *Centropus sinensis parroti* Stresemann

1913. *Centropus sinensis parroti* Stresemann, *Nov. Zool.* 20:323. Type-locality: Ceylon (= Sri Lanka).

Local names: Hokko or Ghoyaro (Gujarati): Māhokā (Hindi): Hookā (Kutch).

Recognition: A heavy-built black bird with chestnut wings and a voluminous long tail; size that of the Jungle Crow (length 480 mm). Sexes alike.

Wings short and rounded, the chestnut of the wing have the shoulder feathers black and flight-feathers tipped with dusky; tail black with a bronze-green tinge, feathers graduated; head, neck and breast coarse glossed with purple-blue; lower plumage dark brown; bill moderately large, deep and curved; eyelashes long and bristly; legs fairly long, stout, strong and naked, hind-toe long and straight (lark-pattern), other claws curved.

Iris bright blood-red; bill legs and feet black.

Distribution: Indian region, south of the Gangetic plains down South to Kerala and East to Orissa west to North Gujarat, Kutch, Saurashtra and Rajasthan (Mt. Abu, Sambhar Lake, Jodhpur).

Habits and habitat: Resident, common, keeps singly, terrestrial; affects bush jungles, wasteland, deciduous as well as thorny and shrubby forests, grass patches along roadsides and village paths, shrubby fencing and hedges of groves and gardens; moves about smartly under canopy of vegetation but when suspicious and cornered flies to another safe bush or perches on some tree; food comprises largely insects, also lizards, snakes, etc.; breeds during rains (June-September); nest- globular, domed structure or a rough saucer made of dry twigs and green leaves build by both the sexes in shrubby bushes, tall grass or on tree-forks; clutch comprises three to five eggs; both the partners take part in incubation.

Voice and calls: A loud 'whoop', during breeding period a distinctive dull booming call in ascending musical scale 'hood-hood-hood-hood' sometimes croaks and chuckles.

INDIAN BARN OWL
175. *Tyto alba stertens* Hartert

1929. *Tyto alba stertens* Hartert, *Nov. Zool.* 35:98. Type-locality: Cachar.

Local names: Revi-devi (Gujarati), Kūrāyā, Krāil (Hindi).

Recognition: A golden and silky white bird with a large round head, white facial disc, and a pair conspicuous ruff of staff feathers; size same as the pigeon (length 360 mm). Sexes alike.

Upperparts orange-buff with five speckles and white spotting on shafts of feathers; facial disc well developed, heart-shaped, silky-white, ruff brown, eyes large, round having ruff around eyes which meet at forehead; wings very long and pointed; tail grey, barred brown; legs long, tarsus and toes feathered with white hairs.

Bill waxy yellow; iris brownish black.

Distribution: Cosmopolitan, species represented by several subspecies. The subspecies (*stertens*) occurs throughout the Indian subregion including the arid and semi-arid areas of Rajasthan and Gujarat.

Habits and habitat: Resident, not common, patchily distributed; generally solitary, sometimes in pairs crepuscular and nocturnal; frequently lives in the proximity of man affecting villages and towns, makes home in hollows of trees or ruins, caves, building-roofs, crevices and lofts of old and dilapidated buildings, farm-barns, also in light woods and rocky regions, spending the day sleeping in dark; food comprises small animals as rodents, birds, reptiles, amphibians, arthropods, etc. Its acute hearing power and powerful vision help it to locate its quarry and its noiseless flight sorties help to take by surprise its victim; breeds almost throughout the year, between spring and autumn most birds breed in Rajasthan and Gujarat; nests in cliffs, holes, hollows and in buildings where it shelters. No nest- untidy pad made of pellets, remains of predated animals, feathers, debris etc., holes, hollows on stone-cliff preferred for egg-laying; clutch consists of 4-7 eggs, female only incubates, incubation period 30-35 days, male joins the female in taking care of the chicks.

Voice and calls: Harsh long-drawn shriek or screech, snores and hiss in the manner of snakes.

STRIATED SCOPS OWL
176. *Otus brucei* (Hume)

1872. *Ephialtes Brucei* Hume, *Stray Feathers* 1:8. Type-locality: Rahuri, Ahmednagar.

Local name: Lintāvāli Chūggād (Gujarati).

Recognition: A little slim brown owl with small ear-tufts above the eyes; size of Starling (length 220 mm). Sexes alike.

General plumage grey with light brown wash, head round; upperparts finely vermiculated and feather-shafts streaked with black; spots on the scapulars buff; tail barred; lowerparts paler and more white, conspicuously and heavily streaked with black; tarsus fully feathered to the base of the toes; eyes orange-brown, bill ivory with brown shade, feet slaty-coloured.

Distribution: Palaearctic, occurs in the Middle-East Asia extending east and south of its breeding area in winter. In the Indian subcontinent it ranges from northwestern India to southwestern India as far as Pune and Khandesh.

Habits and habitat: A winter visitor, uncommon, sedentary, essentially an inhabitant of the semi-arid and arid zone: affects open forest and scattered growth of trees; nocturnal, by day hides away in holes and hollows of trees, with advent of evening resumes its activities by short flights from one perch to another calling to one another; hunts for flying arthropods as well as terrestrial ones, small lizards and mammals also appropriated.

Voice and calls: A monotonous 'boo-boo', sometimes a squeak or short whistle.

GANGETIC COLLARED SCOPS OWL 177. *Otus bakkamoena gangeticus* Ticehurst

1922. *Otus bakkamoena gangeticus* Ticehurst, *Bull. Orn. Cl.* 42:122. Type-locality: Fatehgarh, Uttar Pradesh.

Recognition: A small horned-owl, almost like the scops; size of the Common Babbler (length 230-250 mm). Sexes alike.

Little but prominent 'horns' buff, a pale but conspicuous collar at the upper back; head greyish white with black blotches in the centre; facial disc black; upperparts pale isabelline, streaked and mottled with dark brown; a buffy white patch below the throat; underparts almost white with light brown vermiculations and a few scattered black shaft-stripes; legs feathered white, extending beyond the base of the toes; eyes yellow to brown; bill greenish horny brown; feet greenish yellow.

Distribution: Oriental, ranges from Punjab through Haryana to northeastern Rajasthan, also the riverine plains between the Himalayan Tarai and the Vindhayan hills.

Habits and habitat: Resident, uncommon, affects thin forests and groves in the vicinity of waterholes. Occupies tree-holes and hollows, in which it hides to sleep well concealed in dark during the day, emerging at night to resume its activity; presence indicated by its call; food comprises small terrestrial vertebrates and arthropods, hunting bats and insects on wings; breeds in summer, no nest constructed, nests in natural hollows in trees; clutch consists of three to five eggs; incubation done by the female but the male remains vigilant in protecting the clutch in the absense of the female when she leaves the nest for hunting, both the parents extend care to the nestings.

Voice and calls: A monosyllabic subdued note 'who' produced intermittently every two or three seconds for about a quarter of an hour with a pause of a few minutes to continue again, calling throughout the night.

CENTRAL INDIAN COLLARED SCOPS OWL

178. *Otus bakkamoena marathae* Ticehurst

1922. *Otus bakkamoena marathae* Ticehurst, *Bull. Brit. Orn Cl.* 42:122. Type-locality: Raipur, Madhya Pradesh.

Recognition: About same size as the preceeding bird (length 230-250 mm). Sexes alike. Differs from the subspecies merely in details of colour and tint, being darker and tarsus feathered only up to the base of phalanges.

Distribution: Oriental, occupies the tropical dry deciduous forest type, south of the range of the *gangeticus* between lat. 20° N. In the arid zone of Rajasthan and Gujarat it occurs in Mt. Abu, Gir National Park, Junagarh.

Habits and habitat: Resident, not uncommon in Gir forest but infrequently met with elsewhere. Behaves similar to the preceding bird.

Voice and call: A continuous metallic note 'pink-pink' with intermission.

EASTERN SCOPS OWL

179. *Otus scops turanicus* (Loudon)

1905. *Pisorphina scops turanica* Loudon, *Orn Mber.* 13:129. Type-locality: Repetek, Karakum Desert, eastern Transcaspia.

Local name: Pārdeshi Chuggād (Gujarati)

Field recognition: A little grey-brown horned owlet with a black collar on the back; size that of the Starling (length 190 mm). Sexes alike.

Upperparts greyish brown, feathers delicately vermiculated and speckled grey and rufous, facial-disc light brown and ear-tufts conspicuous like aigrettes, rufous and black, half collar on upper back, feathers on back black-streaked; lowerparts brown.

Iris brownish to golden yellow; legs grey.

Distribution: Palaearctic, Oriental and Ethiopian, the subspecies *turanicus* visits in winter to West Asia, northwestern and western parts of India (Rajasthan and Gujarat) straggling as far south as Bombay and Pune (Maharashtra).

Habits and habitat: Rare, vagrant, sedentary: affects groves and gardens and dry deciduous light forests; nocturnal, taking refuge in holes and hollows during the day, feeds mostly on insects.

Voice and calls: Monotonous tinkling brass-bell sound.

GREAT HORNED OWL
180. *Bubo bubo bengalensis* (Franklin)

1831. *Otus bengalensis* Franklin, *Proc. zool. Soc. London*. 115. Type-locality: The Ganges between Calcutta and Benaras and in the Vindhyan Hills between the latter place and Gurra Mundela.

Local name: Ghuvad (Gujarat) Ghūghū (Hindi).

Recognition: A large powerful stout owl of the size of the Pariah Kite (length 560 mm). Sexes alike.

Head round, facial-disc prominent white with a separable blackish ruff and large piercing eyes, two conspicuous long pointed blackish brown 'horns' or ear-tufts (aigrette) present; upperparts tawny buff and blackish brown, blotched and streaked dark brown, buff and white; wing-feathers chestnut; chin and throat whitish, underparts buff, finely vermiculated and cross-barred and tawny; legs long and thickly feathered to the toes; eyes brilliant orange; bill black; claws dusky.

Distribution: Found throughout the greater part of the subcontinent of India including Rajasthan, and Gujarat.

Habits and habitat: Resident, sedentary, not uncommon in woods and groves along streams around pools and on rocky terrain and semi-arid thorny scrub jungle; roosts in hollows and rocky clefts, also in ruins and old dilapidated buildings; crepuscular and nocturnal hiding itself away by day in suitable dark refuge; flies low close to the ground, slow and gliding, alighting on cliffs or landing on ground for food-gathering; food comprises small mammals specially rodents, hares, birds, reptiles, frogs and arthropods; breeds in winter as well as in summer; nest in cavities and clefts in rocks, hollows and crevices in monuments and ruined buildings or on the ground in a hollow in mere scrapping in the soil by river side or at the foot of trees or under bushes; clutch consists up to four eggs, both the parents take part in the incubation.

Voice and calls: Various calls including deep 'ooo-hu' 'whoot' or 'bu-bo', 'tuck-tuck-tuck', squawk and hiss.

DUSKY HORNED OWL
181. *Bubo coromandus coromandus* (Latham)

1790. *Strix coromanda* Latham, *Index Orn.* 1:53. Type-locality: Coromandel Coast.

Local names: Radiya ghuvad (Gujarat) Jāngli ghūghū (Hindi).

Recognition: Very similar to the Great Horned Owl but grey, also stouter and heavier; size that of the Pariah Kite (length 580 mm). Sexes alike.

Dull in colour, upperparts grey, underparts paler: ear-tufts (aigrettes) greyish brown; wing-feathers brown instead of chestnut; tail brown, barred and tipped white.

Iris pale yellow; pupil blue-black; bill blue-plumbeous; legs and feet light plumbeous.

Distribution: Indian subcontinent including Rajasthan and Gujarat, but excluding the extreme arid areas.

Habits and habitat: Resident, infrequently met with; usually keeps in pair, generally observed perched in trees; prefers open country, avenues along rivers and canals, avoiding extreme aridity as well as humidity; crepuscular and nocturnal, ventures to hunt during the day, specially on cloudy days; food comprises rodents and hares, birds specially crows and waterbird, reptiles and arthropods; nests in tree trunks, generally in old nests of raptors after repairs and enlargement or by usurping ready-built nests of other birds, nests often used for years, hollows in trees also used as nest-site; breeds in winter (December-February); clutch consists of two eggs, sometimes singleton; both the sexes incubate.

Voice and call: Deep low hoot 'guk-guk-guk-groo-groo' or 'hoo-hoo-hoo-hururu'

BROWN FISH OWL

182. *Bubo zeylonensis leschenault* (Temminck)

1820. *Strix leschenault* Temminck, *Pl. col., liver.* 4, pl. 20. Type-locality: Eastern Provinces of India (= Chandernagor, West Bengal.)

Local names: Māchiimārghuvad (Gujarat) Amrāi ka ghughu, Ūllu (Hindi).

Recognition: A massive stout long-eared owl with conspicuous dark vertical streaks on breast and unfeathered legs; size that of the Pariah Kite (length 560 mm). Sexes alike.

General plumage brown; head round and flat without a facial disc-line; eyes large and round; ear-tufts on the head well developed, tipped black; upperparts streaked and mottled with black; underparts white, streaked and barred; upper-breast bears a large white patch; feathers of wings and tail brown; feathers on legs replaced by granular scales on the tarsus and soles of feet by prickly scales resembling that of the Osprey.

Iris golden yellow; bill strong and curved, black; claws sharp, well curved, horny brown.

Distribution: Oriental, extends throughout the Indian subcontinent. In the arid and semi-arid tract it occupies dry deciduous forest patches in Rajasthan and Saurashtra.

Habits and habitat: Resident, sedentary, common in thick forested areas affecting ravines and jheels, rocky cliffs; nocturnal, sleeping by day on trees under thick foliage, activities resume at dusk throughout night till dawn, flight from perch starts with high-pitched screams, fishing in water in the manner of Osprey; food comprises crustaceans, fish, frogs, reptiles, and small mammals specially rodents; breeds mostly in winter and spring (December-March), nesting in tree-holes and hollows, clefts and ledges of rocky beds supported by tall and heavy foliated trees canopying rivulets and riverine banks; at times it occupies deserted nests of other raptors; clutch consists of two eggs, both the sexes incubate (Sambhar Lake, Nagore District,

Rajasthan)* , incubation period approximately 35 days.

Voice and calls: A deep hollow weird call sounding 'haw-haw-haw-ha' 'hu-who-hu'.

NORTHERN SPOTTED OWLET 183. *Athene brama indica* (Franklin)

1831. *Noctua indica* Franklin, *Proc. zool. Soc. London*. 115. Type-locality: Bank of Ganges and the mountain chains of upper Hindusthan, Uttar Pradesh.

Local names: Chibri (Gujarati) Ooloo, Khakusat, Khusattia, Chūghād (Hindi)

Recognition: A small plump dusky greyish owl with a large round head; size that of the starling (length 210 mm). Sexes alike.

Upper plumage brown, spotted with white all over, head broad, round and flat; ruff, ear-tufts absent; eyes bright, staring, nuchal band on upper back white; wings rounded, tail barred pale buff; lower plumage white, transversely barred with brown; legs feathered to the base of toes.

Iris yellow, bill greenish grey; feet yellowish green.

Distribution: Indian sub-continent, ranges from Northwest Frontier (Pakistan) to North and East India, limited to the foothills of the Himalayas in the North and as far as 20° latitude in the South. Found in all situation. In the arid and semi-arid areas of Rajasthan and Gujarat.

Habits and habitat: Resident, common, generally keeps in pairs or in parties of 3-4, well adapted to all climatic zones in India affecting deserts, rocky terrain, woodland, farmland, groves and gardens near about human habitation; crepuscular and nocturnal, emerges from its hide at dusk pronouncing commencement of its activities by varied discordant calls; perches on posts and pillars, horizontal telegraph and power wires; blinks at rest, bobs and bows when alarmed, flying confidently to a vantage position to hunt. Alternate flapping and closing of wings on flight keeps it moving up and down in parabola; food comprises mostly insects, occasionally lizards and small birds; breeds in spring and summer (February-April) in western India, nests in holes and hollows of trees or in crevices; a flimsy nest of shed feathers, grass and debris is built; egg-clutch consists of 3-6, both sexes incubate and extend care to the chicks and fledglings, incubation period 30 days (Sambhar Lake, Rajasthan)."

Voice and call: Squeaks, squalls and sputters in several high-pitched notes, also 'chirurr-chirurr' followed by 'cheevuk, cheevuk, cheevuk' break the silence of the night.

A pair found in Matapahar temple precincts at the edge of Sambhar Salt Lake in January 1958 (A.K.M.)

..

Found to breed in Gudha, Sambhar Lake in February 1959 (A.K.M.)

NORTHERN MOTTLED WOOD OWL

184. *Strix ocellata grisescens* Koelz

1950. *Strix ocellata grisescens* Koelz, *Am. Mus. Novit.* (1452):4. Type-locality: Nichlaul, Uttar Pradesh.

Local name: Ghuvad (Gujarati).

Recognition: A large brown, ferruginous black and white colourful owl, without ear-tufts but with legs feathered to the toes; size of the Pariah Kite (length 430 mm). Sexes alike. Upper plumage brown, vermiculated and mottled with chocolate-brown, black and white; head large, round, facial-disc closely mottled and barred with black and white; eyes large, round, directed forward, a rufescent stripe runs below the eye; top of the head and neck ferruginous; throat bears a white patch; lower plumage white barred with black.

Iris blackish to orange-brown; bill black.

Distribution: Indian subcontinent, ranges from northern India through Punjab, Rajasthan, the Gangetic plain to West Bengal in the East.

Habits and habitat: Endemic, not uncommon in groves and gardens in the vicinity of light forests and avenues; seen solitary or in pairs; nocturnal, during the day takes refuge under shady canopy, with the nightfall actively hunts rodents, birds, reptiles etc.: breeds from autumn to spring (November to April); no nest prepared, occupies holes and hollows of old trees for nesting; clutch consists of one or two eggs.

Voice and call: A loud harsh single hoot, also chuckling notes from time to time.

SHORT-TOED OWL

185. *Asio flammeus flammeus* (Pontoppidan)

1763. *Strix Flammea* Pontoppidan, *Densk. Atlas*, 1:617. pl. 25. Type-locality: Sweden.

Local name: Ravaido (Gujarati).

Recognition: A slim brown owl, feature very similar to that of the Eagle-Owl, with a white round face and black goggled-eyes, legs feathered to the base of claws; size, more or less of the House Crow (length 380 mm). Sexes alike.

Upper parts tawny, blotched and streaked with black and dark-brown, barred and spotted; face round, large with a well marked white facial-disc and bristles all over the face, ruff complete; eyes encircled with dark feathers, ear-tufts blackish brown, scarcely noticeable, visible only when erected; wings long and pointed, barred rufous and black and in flight light chestnut wing-quills become conspicuous, tail bears fawn patches, under plumage pale-buff with longitudinal brown streaks on the breast, abdomen with no transverse marking.

Iris golden yellow; bill slaty black, exposed parts of toes dark brown, claws horny black.

Distribution: Palaearctic, migrating to the Indian subcontinent including the arid and semi-arid tracts of Rajasthan and Gujarat.

Habits and habitat: A regular passage migrant in autumn to the West and Northwest India (onwards journey) and in spring (return journey); moves in parties of a dozen or more affecting long grassy patches, scrubs, reeds and thick bushes on undulations and plains and grassy patches on coasts among sand-dunes, spends the day time resting at the base of a bush, at times lying flat on its belly with wings spread out perfectly camouflaged. With the sunset, it wakes up to hunt and takes to sallying to capture insects on wings; food comprises not only winged-insects but also rodents, birds, lizards, etc.; to escape from predators, it hovers high, rolls, making sommersaults and glides, and many other aerobatic feats to dodge its enemies.

Voice and call: Generally silent in wintering quarter but emits a high-pitched squeal 'chirrr-chirr' when captured.

INDIAN JUNGLE NIGHTJAR 186. *Caprimulgus indicus indicus* Latham

1790. *Caprimulgus indicus* Latham, *Index Orn.* 2:588. Type-locality: India.

Local names: Vāñā Chhāpo (Gujarati); Chippāk, Dābnāk (Hindi).

Recognition: A soft-plumed, long-winged, longish-tailed, moth-like, cryptically coloured bird; size that of the Spotted Dove (length 320 mm). Sexes alike.

Upper plumage grey-brown mixed with buff and fulvous, mottled, streaked and vermiculated with black; centre of the crown streaked with black, head large, mouth very widely gaped, fringed with numerous strong bristles; bill short and weak; eyes very large and shiny; tail graduated, narrowly barred, in male the four outer pairs of tail-feathers have subterminal white spots; tarsus short; almost naked, central toe long.

Iris brown, appears ruby at night with light reflection; feet pinkish brown.

Distribution: Indian subcontinent except the northwestern region (Pakistan, Punjab, western part of Rajasthan and Kutch) and the sub-Himalayan riverine plains. In Rajasthan and Gujarat, limited east of a line drawn through Sambhar Lake, Mt. Abu to the Gir Forests.

Habits and habitat: Resident, common in open scrub, dry and moist-deciduous forest, cultivated fields, groves and gardens to hill-tops; crepuscular and nocturnal, flights hawk-like, erratic, noiseless, and aerobatics as that of insectivorous bats, hunting in twilight and in dark; food comprises, winged termites, ants, bugs, beetles, etc. During the day hours rests on roads and paths under shade among litter or on bare stony ground perfectly camouflaged and still; breeds during summer from March to June. Nest building not known, choice of nesting-site, always in an undisturbed area; clutch consists of two eggs, laid on ground; both the sexes incubate, incubation period about 17 days.

Voice and call: Heard more often than seen; calls specific persistent nocturnal churring specially during the breeding season, audible from a fair distance emits notes 'chuck-chuck-chuck--' chuckoo, chuckoo, chuckoo' repeated in quick succession.

HUME'S EUROPEAN NIGHTJAR
187. *Caprimulgus europaeus unwini* Hume

1871. *Caprimulgus unwini* Hume, *Ibis*: 406. Type-Locality: Agrore Valley and in the neighbourhood of Abbottabad.

Local names: Pārdeshi Cāppo (Gujarati); Chiippāk, Chhāppā (Hindi).

Recognition: Like that of the preceding bird but somewhat smaller; size between the myna and the pigeon (length 250 mm).

Colour of the plumage greyish; presence of white tips on the two outer tail-feathers and a white mark on first three primaries touching the shaft of the feather in male, but in the female the white wing-bars replaced by buff and the white on the tail absent; tarsus feathered up to three-quarters.

Iris dark brown or black; bill black; legs and feet reddish brown.

Distribution: Palaearctic, migrates south of its breeding range in autumn to Kutch, Saurashtra, Rajasthan and in winter to Uttar Pradesh.

Habits and habitat: A passage migrant, not uncommon in Kutch saline belt; affects open arid light forest with undergrowth of dry scrub on sandy ground; roosts during the day in shrubs and under clumps of trees; movement sedentary; nocturnal, feeds on insects on wings.

Voice and calls: Emits a loud, sharp churr 'sweetchee'

SYKES'S NIGHTJAR
188. *Caprimulgus mahrattensis* Sykes

1832. *Caprimulgus Mahrattensis*. Sykes, *Proc. zool. Soc. London*: 83. Type-locality: Mahrattas (?) (= Maharashtra).

Local names: Retāl-chhāpo (Gujarati); Chhippāk, Chhāppā (Hindi).

Recognition: More or less like the Indian Jungle Nightjar but smaller; size that of the Brahminy Myna (length 230 mm).

General plumage sandygrey; upperparts black-streaked and buff spotted, a rufous collar present; outer tail-feathers tipped white in male, fulvous spotted in the female.

Iris darkbrown; bill brown; tarsus almost naked, fleshy brown in colour.

Distribution: South Palaearctic, ranging from South east Iran, Afghanistan, to Pakistan, migrating to Rajasthan, Gujarat, Delhi and South to northern Karnataka.

Habits and habitat: A winter visitor to the arid and semi-arid tracts of India affecting sandy

waster and dry mud-flats sheltering among thorny bushes and in sparse vegetation in sand-dunes; not uncommon on the coastline; more crepuscular than other species of nightjars; sedentary, emerges with the sunset to hawk devouring insects on wings.

Voice and call: Much like the croaking of a frog—a soft but high-pitched continuous ‘prrrrrrrrr’ like the drumming of the Bustard Quail.

COMMON INDIAN NIGHTJAR

189. *Caprimulgus asiaticus asiaticus* Latham

1790. *Caprimulgus asiaticus* Latham, *Index Orn.* 2:588. Type-locality: India (= Bombay.)

Local names: Deshi-chhāpo (Gujarati); Chāpkā (Hindi).

Recognition: A long-winged, long-tailed, owl-like, soft plumed, brown-grey bird with conspicuous black streaks on upper plumage; size that of the Common Babbler (length 240 mm). Sexes alike.

Crown brown streaked with black; upperparts grey, striped with black and buff; a white spot on each side of throat; a broad buff collar; moustacheal streaks long, stiff and rufous white; a white patch prominent on wing; central tail-feathers yellowish grey but cross-barred with black; two outer pairs tipped with white patches; under parts brownish grey; central toe so long that it impedes movement on ground.

Iris dark brown; circumorbital ring yellow; bill dark brown; legs and feet pinkish brown.

Distribution: Indian sub continent, found practically throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; common; keeps in pairs or loose parties; a ground dweller; affects bushy plains, sandy and rocky flats, groves and gardens; during the day rests on ground among fallen leaves under shades of bushes, hedges or exposed in open; crepuscular and nocturnal, entire activity confined to hawking insects on wings; flight zig-zag, like a moth, erratic and unpredictable in movement—a combination of shooting up, wheeling, gliding, diving, flapping of wings with widely extended tail; often met with on country bullock-cart road, resting on ground, occasionally also perches on trees sitting lengthwise on a branch completely camouflaging with the background; food comprises insects as moths, beetles, bugs, crickets; breeds from spring to autumn (March-September); clutch consists of a pair of eggs, laid on ground among scrubs or tufts of grass; both sexes incubate and extend care to chicks.

Voice and calls: Utters distinctive call ‘chuck-chuck-chuckerrr.’ audible from considerable distance.

FRANKLIN'S NIGHTJAR

190. *Caprimulgus affinis monticolus* Franklin

1831. *Caprimulgus monticolus* Franklin, *Proc. zool. soc. Lond.*:116. Type-locality: Ganges between Calcutta and Benares (Varanasi) Uttar Pradesh.

Local names: Franklin-no Chăpo (Gujarati); Chăppā, Debchiri (Hindi).

Recognition: A slender bird with dark rufous plumage and a buff V-shaped design on both shoulders; tarsus thickly feathered; size that of the Common Indian Nightjar (length 250 mm).

Male: Crown marked with fine black arrow heads; a distinct rufescent collar; moustacheal streaks not white; upper plumage overall mottled, barred and streaked with rufous and black; outer tail-feathers all white except black at tip; middle of first four primaries white spotted.

Female: Tail-feathers all barred, white totally absent, spots in the middle of first four primaries rufous-buff.

Iris dark brown, circumorbital ring light yellow; bill dark-brown; legs and feet brown.

Distribution: Oriental, found throughout the Indian subcontinent including the semi-arid region of northwest India.

Habits and habitat: Resident* ; rather uncommon, patchily distributed in dry deciduous forest area; crepuscular and nocturnal; flies low over water surface drinking from time to time and rises up over forest canopy and follows dry nullahs, crop fields to hawk insects on wings; some-times alights on tree-tops; flight like the Common Nightjar; food comprises insects, mostly beetles, wasps, bugs and moths; Breeds** in Gujarat; breeding season from spring to autumn (March-September); courtship display more or less like the doves, birds call before sunset and during the day; eggs laid on bare ground under shelter of bush; clutch consists of a pair of eggs; both sexes incubate.

Voice and calls: A loud sharp grating chirp 'Choo-ee or chwees'- sounds like a whip lash in air.

ALPINE SWIFT

191. *Apus melba nubifuga* Koelz

1954. *Apus melba nubifuga* Koelz, *Contrib, Inst. Regional Exploration*, 1:25. Type-locality: Rathi, Kumaon.

Local name: Păhădi Ăbăbilo (Gujarati); Bădi Ăbăbil (Hindi).

Recognition: A streamlined blackish brown bird with long pointed sickle-shaped wings; size of the bulbul (length 220mm). Sexes alike.

Upper plumage sooty brown very slightly paler on forehead; feathers white-edged; tail

*Observed and heard its specific calls in Jodhpur and Jaisalmer in winter only (Jan.'83) (A.K.M.)

**Dharmakumar sinhji found breeding in Jasdan and Shatrunjay Hills, Gujarat. (Birds of Saurashtra, 1954)

slightly forked; lower plumage white, breast bears a pale brown band; a small white throat patch present; under tail-coverts brown, underside of wings brown and white, lower tarsus unfeathered.

Iris dark brown; bill black; claws black and curved.

Distribution: Palaearctic, Ethiopian and Oriental represented by several subspecies, within the Indian limits, the subspecies (*nubifug*) occupies the peninsula including Saurashtra and Western Rajasthan (Sambhar Lake).

Habits and habitat: Resident, common in Peninsular India rather infrequent in the western parts of India; affects rocky cliffs and mainly arid regions, high hills and sea-coast; roosts in fissures and crevices in cliffs; magnificent flier, moves in loose flocks at a terrific speed; forages on wings, feeding on a great variety of small insects, drinking while skimming on water-surface. Not seen to breed in the arid and semi-arid areas of Gujarat and Rajasthan.

Voice and call: Short shrill screams 'chee-chee' on flight.

HOUSE SWIFT

192. *Apus affinis affinis* (J.E.Gray)

1830. *Cypselus affinis* J.E.Gray, Hardwicke's *Ill. Indian Zool.* 1(2), pl. 35, f 2. Type-locality: No loc. (= Ganges).

Local name: Ābābeelo (Gujarati): Ābābeel, Bābeela (Hindi).

Recognition: A small black bird with long wings, short square tail, and a white patch on rump; size as of the House Sparrow (length 150 mm). Sexes alike.

General plumage sooty black; crown light brown, mouth broad, a deep black spot in front of the eye, chin and throat white; rump with a conspicuous white patch; wings long, narrow, pointed, scythe-shaped; underparts chocolate to blackish brown.

Iris brown; bill short, hooked, horny black; tarsus short and thickly feathered, exposed parts brown; hind-toe sharply curved and reversible.

Distribution: Palaearctic and Oriental, the nominate subspecies (*affinis*) found throughout the peninsula and well represented in Gujarat, Saurashtra and Kutch.

Habits and habitat: Resident, highly gregarious, flocks of a dozen to a hundred individuals may be observed wheeling about sky over town, villages, also in countryside and all along the sea-coast; a slow-flier than other species of swifts, often confused with the House Martin; frequently breaks from its aerial-exercise, dashing to its nest for a while for some exigency, resumes its flight falling in flight-exercise with others; feeds on winged-insects while flying; breeds through the year except in cold months of winter, a colonial breeder, nest- a shallow saucer made of feathers, grass, straw and rubbish cemented together with saliva, nest- clusters touching each other attached to the ceiling, walls of residential houses, temples forts, shrines, or under culverts and bridges; clutch consists of generally two white long oval eggs; incubation period 18-26 days.

Voice and call: Curious squealing 'chirr' often repeated.

COMMON KINGFISHER

193. *Alcedo atthis pallasii* Reichenbach

1851. *Alcedo Pallasii* Reichenbach, *Handb. Spec. Orn.* 3, pl. cccxc II, figs 3043-6. Type-locality: Siberia.

Local names: Lăgothi (Gujarati): Chhota Kilkila, Nika măchrālā or Nikā (Hindi).

Recognition: A stocky built blue-green dagger-billed small bird, size that of the House Sparrow (length 180 mm). Sexes alike.

Upper plumage bright blue, back and rump conspicuous, iridescent blue; a chestnut line from lores to the ear-coverts; cheeks and underparts orange, chin and throat whitish; bill long and pointed and legs short.

Iris brown, bill black, feet coral red.

Distribution: A widely distributed species of the Palearctic, Oriental, Australian and Ethiopian regions, divided into a number of sub-species of which *pallasi* represents in the northwestern India including Rajasthan and Gujarat.

Habits and habitat: Resident, sedentary, common in freshwater areas along running or still water. Affects ponds, lakes, rivers, also estuaries, tidal creeks; avoids heavy forests and desert areas. Sits motionless watching the prey from an overhanging branch or some convenient observation perch, diving perpendicularly into the water for fish, tadpole and aquatic insects; breeds from March to June; nest excavated in steep, sandy or loamy river banks, eggs laid at the end of a horizontal nesting tunnel; clutch consists of 5-7 eggs; both the sexes incubate and take care of the chicks.

Voice and call: A loud and shrill call 'Ch hee' on flight.

WHITEBREASTED KINGFISHER

194. *Halcyon smyrnensis* (Linnaeus)

1756. *Alcedo smyrnensis* Linnaeus, *Syst. Nat.* ed. 10. 1:116. Type-locality: Africa and Asia = Smyrna ex Albin.

Local name: Kălkăliyo (Gujarati): Kilkilā, Kourillā (Hindi).

Recognition: A bright coloured long heavy billed bird; size that of the Common Myna (length 280 mm). Sexes alike.

Upper parts turquoise-blue and chocolate-brown; wings rounded, black, a white wing-patch very conspicuous on flight; crown and nape and sides of head deep chestnut-brown, back and

tail blue tinged with greenish; upper tail-coverts bright pale turquoise; chin, throat and centre of breast white; rest of the lower plumage deep chocolate-brown.

Iris dark brown; bill dull dark-vermilion, tarsus coral red.

Distribution: A widely distributed species of the Oriental Region, the nominate subspecies (*smymensis*) occurs in the northwestern India (Pakistan in the West, Kashmir and northern U.P. in the north, limited to the river Jamuna in the east and as far south as the Gulf of Cambay including Rajasthan and Gujarat).

Habits and habitat: A resident of the plains, except for the desert and dense forests, common everywhere; sedentary; perches on trees, stumps, horizontal wires between poles, cliffs, and rocks along seacoast, residing and flitting nearby water or away from it; noisy on flight as well as when at rest on perch; food comprises fish, crustaceans, aquatic as well as land insects, earthworms, lizards, small rodents, chicks, etc. captured by direct swoop; breeds from March to July; clutch consists of 4-7 eggs, laid at the end of a horizontal tunnel, a meter long or so, excavated by both the sexes in the faces of banks or borrow-pits nearby water; both the partners share incubation and care of chicks.

Voice and calls: Emits loud cackles, sometimes repeated chattering calls.

EUROPEAN BEE-EATER

195. *Merops apiaster* Linnaeus

1758. *Merops apiaster* Linnaeus, *Syst. Nat.*, ed. 10, 1:117. Type-locality: Europa australi: Oriente'.

Local names: Vilāyāti Pātrāngiyo (Gujarati); Bāda Hārriāl (Hindi).

Recognition: A long slender bird of the size of the bulbul (length 270 mm). Sexes alike.

Upper plumage green; head and mantle chestnut; wing-feathers green, tipped black; back creamy yellow; central tail-feathers green, elongated, tipped black; throat brilliant yellow; underparts bluish green.

Iris red; bill black; legs and feet brownish to greyish brown.

Distribution: A widely distributed species of the southwest Palaearctic and Oriental regions, more or less sporadically distributed in the Indian Region; a passage migrant to north western India including Rajasthan, Punjab and a straggler in Gujarat and as far South as Bombay.

Habits and habitat: An essential inhabitant of the temperate, and desert climatic zones. Affects open country in winter dry region; gregarious, perching on telegraph wires or on bushes from where it hawks winged-insects with buoyant flight; food comprises beetles, wasps, dragonflies, moths and butterflies, midges, etc.

Voice and call: Musical call 'tree'-'tree' usually on flight.

BLUECHECKED BEE EATER
196. *Merops superciliosus persicus* Pallas

1773. *Merops persicus* Pallas, *Reisa Russ. Reich* 2:708. Type-locality: Shores of the Caspian Sea.

Local name: Moto-pātrāngiyo (Gujarati); Bādā pātringa (Hindi); Bādā hajamda (Kutch).

Recognition: A bright green, long-billed, stream-lined bird; size of the bulbul (length 310 mm). Sexes alike.

Forehead whitish, merging to blue; crown and back green; rump and tail verditer-blue, central tail-feathers tipped black; a broad black streak from the beak through the eye, sides of the head more blue, cheek-patch white and blue; throat yellow; upper breast chestnut; underparts green; under tail-feathers blue.

Iris crimson; bill horny black; legs and feet dusky plumbeous.

Distribution: Widely distributed from western Asia including Egypt through Palestine and Caspian Sea to northwest India including western Rajasthan, Saurashtra, Kutch and as far South as Deccan.

Habits and habitat: A summer and autumn visitor (? resident in Saurashtra; more of a desert bird). Other habits similar to that of the preceding bird (*apiaster*).

Voice and call: A musical mellow 'kreet'-kreet'

SIND SMALL GREEN BEE-EATER
197. *Merops orientalis beludschicus* Neumann

1910. *Merops viridis beludschicus* Neumann, *Orn. Mber.* 18:80. Type-locality: Sarbac, Persian Baluchistan.

Local names: Nāno pātrāngiyo (Gujarati); Pātringo, Hārriāl (Hindi); Chhota hājāmda (Kutch).

Recognition: A long slender, grass-green bird with a long bill and tail; about the same size as that of the House Crow (length 210 mm). Sexes alike.

Crown and neck have golden sheen; chin and throat pale blue, bordered below by a black gorget; flight-feathers (primaries) rufous, tipped black; tail-feathers blue-green, elongated central feathers extending beyond the main tail-feathers.

Iris, crimson; bill, brownish black ; legs and feet, yellowish brown.

Distribution: Southwest Asia, ranging from East Iran to northwest India including northern and western Rajasthan, northern Gujarat and Kutch.

Habits and habitat: Possibly a migrant; not uncommon in winter and spring, scattered parties of a dozen or two often met with, perched on overhead telegraph wires or on dry branches; affects plains, both cultivation, grazing land in desert and semi-desert tracts; hawks insect on wings; food comprises winged-insects on flight.

Voice and call: Musical jingle like that of the cricket 'prit-prit-prit' uttered while sallying or on perch.

GREEN BEE-EATER 198. *Merops orientalis orientalis* Latham

1801. *Merops orientalis* Latham, *Index Orn.* Suppl: xxxiii. Type-locality: India = Pondicherry.

Local name: Same as in the preceding bird.

Recognition: Distinguishable from the race (*beludschicus*) in being darker; head and neck tinged with rufous and much blue on the throat.

Iris, crimson; bill brownish black; legs and feet, yellowish brown.

Distribution: Throughout India except northwest and northeast India and Sri Lanka.

Habits and habitat: Resident, quite common in the plains, prefers vicinity of water, perched on telegraph and overhead power wires and in absence of such perches dry branches and low bushes. Social at roosts, congregates in bamboo-clusters or busy thick foliage trees; flights undulating, hawks insects from its perch flying back to its perch after the capture of its prey which comprise winged-ants, termites, bees, moths and butterflies, damsel and dragonflies, dipterous flies, etc.: breeds in spring and summer (February-June); nests made in vertical walls in river banks or earth-cuttings; circular tunnels about a metre or two, dug and eggs deposited on the floor of the circular chamber at the end of the tunnel; clutch-size varies from three to six; both sexes incubate and extend parental care to chicks.

Voice and call: A pleasant musical trill 'tree-tree-tree' uttered on flight.

KASHMIR ROLLER 199. *Coracias garrulus semenowi* Loudon & Tschudi

1902. *Coracias garrulus semenowi* Loudon & Tschudi, *Orn. Jb.* 13:148. Type-locality: Transcaspia.

Local name: Kāshmiri Nilkāntha (Gujarati).

Recognition: Similar to the Indian Roller in size but slimmer. Sexes alike.

Lowerparts pale blue throughout; crown and nape greenish blue, bill short, strong gape with strong bristles; upper back chestnut, flight feathers blackish brown; lower back and rump dark blue, tail pale blue.

Iris pale brown; bill brownish black; legs and feet straw yellow.

Distribution: A West palaeartic species, the subspecies (*semenowi*) ranges from Transcaspia through Turkestan south to Iran Baluchistan and east to Kashmir where it breeds enroute migration, stops over in Rajasthan, North Gujarat, Saurashtra and Kutch and straggles as far south as Deccan.

Habits and habitat: A passage migrant in West India in autumn and spring. Affects open country, grassy areas and patches of bare sandy loamy soils, also cultivated tracts, scattered trees, groves and garden. Met with singly on some convenient perch; normal flight fairly direct, rather slow, escapes from its predators, generally aerobats and rolls; feeding habits that of the Indian Roller, entirely carnivorous.

Voice and call: Loud 'hack'-'hack'

NORTHERN INDIAN ROLLER

200. *Coracias benghalensis benghalesis* (Linnaeus)

1758. *Corvus benghalensis* Linnaeus, *Syst. Nat.* ed. 10, 1:106. Type-locality: Benghala (= Purulia district, West Bengal).

Local names: Deshi Nilkānt (Gujarati); Nilkānt, Sābjāk (Hindi)

Recognition: A heavy built stocky bird characterised by its bright blue-green plumage; size that of the Rock Pigeon (length 310 mm). Sexes alike. Head noticeably large, pale buff, crown bluish green; bill rather long, heavy, compressed crow-like, gape with strong bristles; chin and breast dark chestnut, faintly streaked with white; a faint collar of purplish lilac; upper plumage dull green mixed with brown; wings and tail have two shades of blue, conspicuous on flight, Oxford-blue and azure that flash brilliantly; abdomen and lower tail-coverts pale blue.

Iris grey-brown, naked skin around the eye, dull orange; bill blackish brown, legs and feet brownish yellow.

Distribution: Confined to the Oriental Region ranging from West Asia to Upper India as far East as West Assam, submontane tracts of the Himalaya and South to Central India (plains and hilly tracts.).

Habits and habitat: Resident, very common; affects open country in and around cultivation or grassy areas; found singly on telegraphic poles and wires or dry branches of trees, projections of buildings. From some convenient perch it falls straight on its prey and after the hunt returns to its perch; food comprises large insects as grasshopper, mantid, locust, gryllid, frog, lizard, small rodent, etc. Courtship commences in February when the birds are seen in pairs, the male, flapping its wing and screaming harshly, flies up to perform somersaults and dives to draw attention of the female; breeds in spring and summer (March-June); nest in holes and hollows of trees, rock crevices, holes in buildings, clay walls, generally appropriating the old nesting tree-holes of woodpeckers, parakeets, barbets, and clay-holes excavated by kingfishers, bee-eaters and others. Nest lining composes fragments of leaves, fibres, twigs, feathers, egg-shells and all

possible rubbish; clutch consists of three to five eggs; both the sexes incubate, incubation period 17-18 days; both the parents extend care to their chicks and fledglings.

Voice and call: Harsh grating scream 'kurr' and 'tuck' at perch. very noisy, screeching when irritated and on flight 'chak-chak-chak-chak'

EUROPEAN HOOPOE

201. *Upupa epops epops* Linnaeus

1758. *Upupa Epops* Linnaeus, *Syst. Nat.* ed. 10, 1:117. Type-locality: Europae sylvis (= Sweden).

Local names: Ghati Tankno (Gujarati); Hūdhūd (Hindi).

Recognition: A fawn-coloured crested bird having a decurved long bill; size that of the Common Myna (length 310 mm). Sexes alike.

Feathers of the crest elongated, rufous-fawn, broadly tipped with white and black, freely lowered and raised, erected to a broad fan-shape and folded to a point; mantle cinnamon-brown, upperparts striped black and white; wings barred black and white; rump whitish; tail black with a white central bar; throat and breast rufous-fawn, rest of the lowerparts white; legs short but well adapted for terrestrial movement.

Iris red-brown; bill horny black; legs slate-coloured.

Distribution: A species of the Palaearctic Region, widely distributed in Europe, Africa and Asia, the nominate subspecies (*epops*) breeds in the Himalayas and winters in the plains and hills as far south as Madhya Pradesh, east to Bihar, west to Rajasthan and Gujarat. The subspecies (*saturata*) and (*ceylonensis*) reported from northern India and Gujarat are infrequently met with.

Habits and habitat: A migratory and sedentary bird, met with singly or in scattered group of three or four moving on the ground in the manner of doves and pigeons; affects open parkland, forest clearings, cultivated and fallow-land, around groves and gardens, scrubby tracts in desert and semi-desert areas. Flight slow, undulating for short distance; forages on ground as it walks by probing its long bill into cracks and holes in the soil, turning over leaves, searching for morsel in debris; food comprises insect larvae, mole cricket, beetles, spiders, scorpions, lizards, etc.

Voice and call: A mellow 'hoot'- 'hoot'- 'hoot'

COPPERSMITH

202. *Megalaima haemacephala indica* (Latham)

1788. *Bucco indicus* Latham, *Index Orn.* 1(1):205. Type-locality: India.

Local names: Tūktūkiyo (Gujarati); Chhota bāsānth (Hindi).

Recognition: A crimson-headed greenish and gaudy yellow, arboreal, heavy-built small bird;

size same as that of the Weaver Bird (length 170 mm). Sexes alike.

Chin and throat yellow, a crimson broad gorget across the breast; a broad black band through eyes and gape to the top of the head; upperplumage olive-green, wings short, washed with green; tail short, truncated, washed below with verditer-blue; lowerplumage yellowish white, streaked dull crimson.

Iris dark brown; bill short, stout, horny brown; legs short; coral red.

Distribution: Throughout the Indian region from plains to 2000 metres altitude, except the extreme arid tracts of Western Rajasthan and Kutch.

Habits and habitat: Resident, common; affects dry and moist deciduous biotope. Prefers light forest, groves and gardens, specially larger old trees in village areas as well as outskirts and open areas of towns and cities; flight strong and straight; generally occupies the tops of trees, sitting upright and feeding amongst green leaves well camouflaged. Mainly frugivorous, food comprises various species of wild figs, at times captures insects for feeding the chicks; breeds from February to May, sometimes in November and December; two broods may be raised. Holes in trunks and branches of older trees drilled by both the partners, cutting out a smooth gallery, a metre or so in length terminating in a broad chamber for depositing eggs; egg-clutch consists of three or four; both the partners incubate and extend parental care to the chicks.

Voice and call: a characteristic loud voice very similar to the hammer and metal work produced by the coppersmith, a continuous 'tunk'- 'tunk'- 'tunk'... for an indefinite period.

NORTHERN GREEN BARBET 203. *Megalaima zeylanica caniceps* (Franklin)

1831. *Bucco caniceps* Franklin, *Proc. zool. Soc. Lond.* 1:121. Type-locality: On the Ganges between Calcutta and Benares, and the Vindhyan Hills between the latter place and Gurrah Mundela on the Nerbudda.

Local names: Lilo Tūktūkiyo (Gujarati); Bāda Bāsānt (Hindi).

Recognition: a green plumpy stout-billed arboreal bird, size that of the Common Myna (length 270 mm). Sexes alike.

Head, upper back and breast brown with narrow pale shaft-streaks; upper plumage grass green with whitish pale shaft-streaks; tail bright green; undertail verditer-blue.

Iris reddish brown, naked space around the eye broad and continues up to the base of upper mandible coloured orange; bill fleshy pink; legs and feet lemon-yellow.

Distribution: Confined to the foothills of the Himalayas from western to central Himalayas and in the plains and hills of Indian Peninsula limited to Mt. Abu and eastern Gujarat and east to West Bengal and Orissa and South to the Godavari river.

Habits and habitat: Resident, common in well-wooded patches in adequately watered areas from plains to 1000 metres altitude; arboreal, keeps to thick foliated trees, seen singly or in parties of 10-20 or more on fruit laden trees, feeding on drupes and berries, chiefly wild figs; flight heavy and undulating, sorties from tree to tree undertaken; breeds from March-April, nesting in holes of trees excavated by both the sexes industriously. No nest as such build, eggs laid merely on floor or on debris; clutch consists of three or four eggs and both take part in incubation and raising chicks.

Voice and call: Monotonous, characteristic disyllabic call throughout the day- 'kotruk'- 'kotruk'- 'pakro'- 'pakro'

WRYNECK

204. *Jynx torquilla torquilla* Linnaeus

1758. *Jynx Torquilla* Linnaeus, *Syst. Nat.*, ed. 10, 1:112. Type-locality: Europa (= Sweden).

Local names: Thād rānga (Gujarati); Gārdān eyengtha (Hindi).

Recognition: An oblitteratively coloured, nightjar patterned, piculet-like, slim bird- a little larger than the House Sparrow (length 190 mm). Sexes alike.

Upperparts silvery grey, finely vermiculated with dark brown; back streaked black; tail square, grey with three or four conspicuous dark bands; throat and neck yellowish buff, barred black; breast whitish with a few triangular arrow-head markings, lowerparts finely barred; bill horny brown; legs and feet light brown.

Distribution: a Palearctic species, migrates to the tropics of the Indian subcontinent from the north west to eastern India as far as West Bengal and South to Kerala. It occurs in Rajasthan, and Gujarat.

Habits and habitat: A winter visitor, seen sporadically, solitary, shy, not uncommon in particular season in its preferred habitats like dry and moist forests, forest edges, scrubland, arable as well as fallowland, in and around groves and gardens, hedges and along roadside; it behaves as a woodpecker but does not drum to chisel wood; it perches on trees like a sparrow but behaves as a robin hopping about on the ground cocking its tail. When alarmed it stretches its neck, erects its forehead feathers and turns its head from side to side to keep an watch over its predator; food comprises, insects, specially weevils, ants and their larvae,

Voice and call: Usually silent during migration; a shrill sound 'chewn'- 'chewn'- 'chewn' sometimes produced to communicate with the fellow birds.

LITTLE SCALYBELLIED GREEN WOODPECKER

205. *Picus myrmecophoneus* Stresemann

1920. *Picus myrmecophoneus* Stresemann, *Verh. Orn. Ges Bayern*, 14:289. Type-locality: Himalaya and Central India.

Local names: Lāl-chottili Lākkād-khod (Gujarati); Nānha Kātpkor (Hindi).

Recognition: A stout, crimson-crested, scaly-bellied woodpecker; size that of the Common Myna (length 290 mm).

Female differs from the male in having the colour of the crown-crest feathers black instead of crimson, otherwise sexes alike.

Mantle wholly green; nape bears an orange and black patch; rump bright yellow; tail stiff, pointed, wedge-shaped, greenish brown practically unbarred; underparts squamated with scaly black; a white eyebrow with a black line above it.

Iris pinkish white; bill horny slate; legs and feet dull-green.

Distribution: An Oriental species. In India found in drier parts including the arid and semi-arid tracts of northwestern India.*

Habits and habitat: Resident; common in dry deciduous forest patches ; flight heavy and undulating; usually moves in pairs one following the other in flight; food comprises arthropods specially insects and grubs at ground level among fallen leaves and boulders, and also moss-covered foot of trunks; breeding period spring and summer (March-May); both sexes chisel a circular hole in trunk, some four to ten metres above the ground level, nest hole varies from four to six cm in diameter and about 50 cm deep, terminating in a bulbous chamber; clutch consists of three to five eggs; both sexes incubate and extend care to chicks.

Voice and calls: emits a loud note 'tchen-tchen-tchen'..... when excited, otherwise silent.

LESSER GOLDENBACKED WOODPECKER 206. *Dinopium benghalense dilutum* (Blyth)

1849. *Br [-achypternus-] aurantius* var. *Br [-achypternus-] dilutus* Blyth, *Cat. Bds, Mus. Asiat. Soc.*: 56. Type-locality: Sind.

Local names: Soneri Lăkkăd-khod (Gujarati); Sonā-kătphora (Hindi).

Recognition: A golden yellow-backed, red-crested, four-toed woodpecker; size that of the Common Myna (length 290 mm).

Male (adult): Forehead black and white, occipital crest bright crimson; head and neck white; back and wings brilliant lemon-yellow and black; chin and throat streaked with black and white; breast and abdomen white streaked with black; rump black; tail black, pointed and stiff acting as a support on trees, outer tail-feathers longer than the upper tail-coverts.

Female: differs from the male in having the forecrown black spotted with white; occipital crest crimson, but shorter.

* Gir National Park 1984, Aravallis-Mt. Abu foothills 1983, Sambhar Lake-Gudha 1957-58.

Iris reddish brown, eyelids plumbeous green; bill slaty black; legs and feet grey; claws dusky.

Distribution: Oriental, found in the Indian subcontinent including the dry deciduous forest areas in northwestern India.*

Habits and habitat: Resident; common, found singly or in pairs; affects dry deciduous or semi-deciduous forests also found in groves in and around villages, along roadside trees, canals and trees round reservoirs; flight heavy and undulating, swooping from tree to tree, grasping the bark with its strong claws, ascending in spiral fashion keeping in a perpendicular position and sometime descending with reverse gear, exploring xylophagus insects in old trees, drumming with its sharp pick axe bill to dislodge underbark insects; food comprises, insects, larvae, grubs and insect eggs, ants and weevils, sometimes berries, pollen and nectar; breeds in spring and summer (March-May); both sexes bore hole preferably in softwood trees not very high up from the ground level; nest-holes (6-8 cm, diameter) communicate with the oval egg-chamber (15-16 cm, diameter) by tunnels 5-6 cm in length; clutch consists of three eggs; both sexes share responsibility in incubating and tending the chicks.

Voice and calls: Loud, harsh calls 'ki-ki-ki-ki' repeated.

YELLOWFRONTED PIED WOODPECKER 207. *Picoides mahrattensis mahrattensis* (Latham)

1801. *Picus Mahrattensis* Latham, *Index Orn. Suppl.* XXXI. Type-locality: India (= the Mahratta country).

Local names: Kābāro Lākhād-khod (Gujarati); Kātphorā (Hindi).

Recognition: A small yellow-crowned, dingy pied, woodpecker; size more or less that of the Bulbul (length 180 mm). Sexes alike except absence of a scarlet crest in female.

Upperparts barred and spotted sooty brown, and white; a small scarlet crest in male; bill fairly long and stout; chin and throat white, a brown stripe on the sides of the neck; wings and tail blackish brown, heavily spotted with white; tail-feathers short and sharply pointed; abdomen dirty white, streaked with brown, a bright scarlet patch in the centre of the abdomen and under tail-coverts.

Iris deep red; bill, legs and feet plumbeous.

Distribution: Oriental, found in drier parts of India including the dry deciduous forested areas of northwestern India.

Habits and habitat: Resident; common; keeps solitary except during breeding season; affects dry zones of plains and hills; prefers thorny and scrubby forests to thick timber forest blocks; flight undulating from tree to tree concealing itself behind the branch when suspicious;

*Mt. Abu, the Aravallis and Gir National Park, Saurashtra, 1984; Jodhpur 1983, Sambhar Lake 1958.

food comprises insects, specially woodborers, ants, termites, spiders and at time fruits; breeds in spring (March-April); nests in holes generally in the underside of branches; small holes (3.5-4.0 cm in diameter) excavated by tunnelling about 35 cm in wood, terminating in an irregular chamber; clutch comprises three eggs; both sexes take part in incubation and in tending the chicks.

Voice and calls: A feeble 'peek' or a harsh 'kirrick-kirrick' repeated at short intervals.

BROWNHEADED PYGMY WOODPECKER

208. *Picoides nanus nanus* Vigors

1832(1831-32). *Picus nanus* Vigors, *Proc. zool. Soc. Lond.*(1):172. Type-locality: Himalayas.

Local name: Nāno Lākkād-khod (Gujarati); Chottā Kātpor (Hindi).

Recognition: A dull-coloured pied small woodpecker; size that of the House Sparrow.

Upper plumage dark brown barred with white, crown greyish brown, scarlet on the sides of the head in male restricted to a narrow bar, absent in female; a broad white stripe above the eye running back to the side of the neck; central tail-feathers all black; underparts dirty white, streaked with diffused light brown.

Iris yellow, eyelids magenta; bill horny grey; legs and feet greyish brown.

Distribution: An Oriental bird, confined to Upper India including the forests in the semi-arid areas in the northwestern India.

Habits and habitat: Resident; not uncommon in deciduous secondary forest groves and gardens; keeps in pairs; flits from one branch to the other, tapping as it moves on trunks or boughs of dead trees, mostly occupying the higher branches; feeds mostly on insects and grubs collected from under barks and also ants, berries drupes nectar and pollen; breeds in spring and summer (March-July); nest-holes drilled out in brach by both the sexes, diameter of the hole varies from three to four cm and about 20 cm deep to communicate with the egg-chamber; clutch consists of three eggs; both sexes share incubation and extend care to the chicks.

Voice and calls: A prolonged feeble 'ki-ki-ki-ki' emitted.

INDIAN PITTA

209. *Pitta brachyura brachyura* (Linnaeus)

1766. *Corvus brachyurus* Linnaeus, *Syst. Nat.*, ed. 12 1:158. Type-locality: Moluccas (= Ceylon = Sri Lanka).

Local names: Nāorāṅgā, Hāriyo (Gujarati); Nāorāṅg (Hindi).

Recognition: A strongly built, veriegated plumed, large headed, stub-tailed terrestrial bird

with an upright carriage; legs long and stout; a white patch on wing-tips conspicuous in flight; size, slightly smaller than the Myna (length 190 mm). Sexes alike.

Head pale fulvous with three distinct stripes running through the centre of the crown, sides of head and neck and an additional narrow white line over the eyes; upper plumage grass-green with a bronze wash; wings broad, rounded, primaries white, tipped black; wing-black, tipped dull blue; chin and throat whitish, underparts fulvous; lower abdomen and undertail bear a bright scarlet patch.

Iris dark brown; bill blackish brown; legs and feet flesh coloured.

Distribution: Indian subcontinent, including west and central Rajasthan and the Kathiawar Peninsula.

Habits and habitat: Locally migratory, a few breed in Rajasthan and Gujarat, infrequently met with; solitary and secretive; generally affects deciduous forests and scrub jungles; prefers bushy jungle with scattered tree-cover along small ravines; hops and runs under bushes, at times resorts to trees; food comprises largely insects, spiders and grubs; breeds in summer and during monsoon rains (May-September); male pugnacious, maintains a territory; nests in trees in low branches (2-4 metres); nests of twigs dry leaves, grasses and fibres made into a globular structure with a circular entrance near the top; clutch consists of 4-6 eggs; both sexes incubate and extend care to the chicks.

Voice and calls: A sonorous high-pitched whistle repeatedly emitted in the manner of the domestic cock. The call notes "wheat pe-u" "whee-pee-ooo" reciprocated by other members.

SINGING BUSH LARK 210. *Mirafra javanica cantillans* Blyth

1844. *Mirafra cantillans* Blyth, *J. Asiat. Soc. Beng.* 13:960. Type-locality: Bengal (= Calcutta).

Local names: Āgān (Gujarati); Āgān, Āgin (Hindi).

Recognition: A hen-sparrow like bird with a short bushy crest, but with a different flight more like the Skylark; white of the tail and rufous of the wing conspicuous in flight; size that of the sparrow (length 150 mm). Sexes alike.

Crown crest prominent when erect during display; upper plumage dark-rufous-brown streaked with blackish brown wings more rufous than of the sparrow; design of the wing-coverts shield-like, basal one-half of the primaries rufous; throat buffy white, breast streaked and striped with brown marks; underparts buff; tail short and brown; inner webs of the outer feathers largely white or pale rufous.

Iris hazel brown; bill horny brown; legs and feet pale brown or pinkish.

Distribution: All India except extremely arid and wet regions; found patchily in Rajasthan, and Gujarat.

Habits and habitat: Resident; keeps singly or in pairs; more terrestrial, running about to collect morsel; affects broken and sandy semi-arid open busy country, cultivated fields spread over plains and undulating land; food comprises seeds of weeds and grass; insects and spiders; breeds from June to October. During the breeding time, the male performs aerobatics with songs, shooting up to 30 metres in air and hovering for a long period to be drifted to a far distant area, when it suddenly drops down to alight to rest in some bush or on ground. Such performance repeated again and again. A ground nester, nests made of grass, saucer-or dome-shaped, kept concealed under cover of thick shrubs or thorny bushes; clutch consists of 2-4 eggs.

Voice and calls: A short and pleasant note 'tee-ur' emitted on wings, also an expert imitator of other bird's calls.

REDWINGED BUSH LARK

211. *Mirafra erythroptera sindiana* Ticehurst

1920. *Mirafra erythroptera sindianus* Ticehurst, *Bull. Br. orn. Cl.* 41:56. Type-locality: Karachi, Sind, Pakistan.

Local names: Āgiya āgan (Gujarati); Āgyiā (Hindi).

Recognition: A thick short-billed sparrow-like bird with a long gently curved hind claw, a short uniform brown tail and rufous wings; size that of the House Sparrow (length 140 mm). Sexes alike.

Crown streaked with black; rufous on wing conspicuous in flight; chin and throat dusky white; breast marked with blackish spearhead; underparts light fulvous.

Iris brown; bill horny brown (upper mandible, fleshy (lower mandible)); legs and feet pale flesh-coloured.

Distribution: Patchily distributed in northwest India, including northern Gujarat, Saurashtra and Kutch.

Habits and habitat: Resident; common, keeps in pairs or small parties; affects arid and semi-arid broken country and sandy tracts that support thorny bushes and scrub, and short grass patches; terrestrial and a ground feeder; food comprises grass-seeds and tiny insects; shoots suddenly up in air and flies fast, dropping down after a short flight to the ground; breeds from March to October; nuptial display starts with a sudden vertical flight in air, emitting short melodious whistles and floating in air, getting drifted by breeze, finally descending with outstretched wings to settle on a bush or on ground-such acts repeated several times till the hen gets attracted; nest- a shallow saucer, sometimes domed or half-domed; nest made of grass palced in small depression on ground generally under cover of bushes; clutch consists of 3-5 eggs.

Voice and calls: Normally emits a twittering note, during a courtship a monotonous whistling note 'tee-tee-tee' on flight display.

ASHYCROWNED FINCH-LARK

212. *Eremopterix grisea* (Scopoli)

1786. *Alauda grisea* Scopoli, *Del. Flor. Faun. Insubr.* 2:95. Type-locality: Gingee, South Arcot District, Tamil Nadu.

Local names: Bhon-chākli (Gujarati); Diyora, Dūri, Deoli (Hindi).

Recognition: A sandy grey-brown, crestless, short and thickbilled squat bird; size that of the munia (length 130 mm).

Male: Crown ashy, cheeks white, upper plumage pale ashy brown, underparts dark chocolate brown or black.

Female: Sandy brown above, cheeks rufous; outer pairs of tail-feathers almost white; underparts pale rufous.

Iris brown; bill horny grey with bluish wash; legs and feet fleshy brown.

Distribution: Found throughout the Indian subcontinent except the heavy rainfall areas.

Habits and habitat: Resident; common, keeps in pairs at times in flocks; affects dry open country, plains, wasteland, fallow and ploughed fields, scrubby patches in arid and semi-arid areas; more or less keeps to ground collecting morsel on dusty roads and paths; food comprises minute grass and weed seeds, insects, spiders, etc.; roosts in ground in sand and dust camouflaging against the background rendering it inconspicuous; flights-series of rise and fall restricted to a small area, on shooting up to a height it hovers and closes its wings to fall vertically almost to the ground but rises again; breeds practically throughout the year but mostly in summer; nest made of soft grass and vegetable fibres, laid in ground in small depression in open and under shrubs and in tuft of grass; clutch consists of a pair of eggs, sometimes may be three.

Voice and calls: On flight emits a sweet long-drawn 'trreee' note.

BLACKCROWNED FINCH-LARK

213. *Eremopterix nigriceps affinis* (Blyth)

1867. *Pyrhulauda affinis* Blyth, *Ibis*: 185. Type-locality: Karachi, Sind, Pakistan.

Local names: Bhon-chakli (Gujarati); Dūri, Dābāk-chiri (Hindi).

Recognition: A sandy grey sparrow-like squat bird with a white forehead and blackish crown in male. Female paler and sandier; size that of the munia (length 130 mm).

Iris brown, bill pale horny (upper mandible), bluish (lower mandible); legs and feet light brown.

Distribution: Northwest India including arid and semi-arid tracts of Punjab, Haryana, Rajasthan, northern Gujarat and Kutch.

Habits and habitat: Resident, keeps in small parties, quite common; affects sandy desert biotope; mostly keeps to ground and perfectly camouflages against the sandy background; feeds by running about to collect grass and weed seeds as well as minute insects; nuptial flight during breeding period, comprises a short tie and drop to ground, singing during such aerobatics; breeds during February and September; nest- made under cover of grass tuft, placed with much care to avoid hot blast; clutch consists of 2-3 eggs.

Voice and calls: A pleasant but monotonous trilling note.

INDIAN RUFOUSTAILED FINCH-LARK
214. *Ammomanes phoenicurus phoenicurus* (Franklin)

1831. *Mirafra phoenicura* Franklin, *Proc. zool. Soc. Lond*: 119. Type-locality: Between Calcutta and Benares (= Varanasi), Uttar Pradesh.

Local names: Khetāriyo (Gujarati), Āggia, Rētāl (Hindi).

Recognition: A bright rufous-tailed, short-billed crestless lark of obliterative colour; size that of the sparrow (length 160 mm). Sexes alike.

Crown and upper parts dark brown; sides of the head mixed rufous and brown, a patch around eye streaked with pale rufous; tail slightly forked; tail-coverts deep rufous with a black band at the terminal end; chin, throat and breast rufous streaked with brown; abdomen rufous.

Iris hazel-brown; bill horny brown; legs and feet fleshy brown.

Distribution: Northwest India including Punjab, Haryana, Rajasthan, Gujarat limited to the Gangetic plains as far east as West Bengal, south to Andhra Pradesh.

Habits and habitat: Resident; generally seen in pairs during breeding season and in large and small flocks in non-breeding season; affects open country, ploughed fields, sandy tracts, generally keeping to ground in search of food material; food comprises grass and weed, seeds, also small insects; breeds mostly during spring and summer, seen to perch on a bush to sing, suddenly shoots up in air to about 15 metres and nose dives in steps with wing closed, at each successive stage it erects its posture vertical with head high and tail pointing to the ground, such short steps result in undulating flight; breeds in spring and summer; nests in open plains, ploughed fields in slight depression in ground sheltered under shrubs or tufts of grass; nest made of grass, sticks and rubbish; clutch consists of 2-4 eggs; both sexes incubate and extend care to the brood.

Voice and calls: A short twittering melodious call repeated from time to time and also during display flight during breeding time.

LARGE DESERT LARK
215. *Alaemon aludipes doriae* (Salvadori)

1868. *Certhilauda doriae* Salvadori, *Atti R. Acad. Torino*, 3:292. Type-locality: Iran.

Local names: Rānn-chāndūl (Gujarati).

Recognition: A fairly long and curve-billed grey lark with upright posture, white bands on wings conspicuous in flight; size that of the Turtle Dove (length 230 mm). Sexes alike.

Head grey with dark streak across the eye and a pale white supercilium; upperparts sandy grey; a blackish line runs from bill to cheek; throat and breast white streaked with dark brown; abdomen white; tail black, outer-feathers edged white.

Iris brown; bill greyish green; legs and feet china-white.

Distribution: Northwestern India including north western Rajasthan*, North Gujarat, Kutch and Saurashtra.

Habits and habitat: Resident, rather uncommon; generally found singly, sometimes in pairs during breeding season; affects flat and undulating sandy desert and parched salt-encrusted flats; keeps mostly to the ground, runs in spurts to collect food material, at times with considerable pace to escape from predator, and when compelled takes to wings, flying low and leisurely wandering a lot to settle again on ground; food comprises largely insects, seeds of grass and xerophytes; breeds from March to July; cup-shaped nest made of grass, sticks and feathers placed in stunted bushes or grass clumps; clutch consists of 2-3 eggs; female incubates while the male guards.

Voice and calls: Sings mostly during breeding season. During aerobatic display emits high-pitched notes 'tee-tee-tee' while ascending vertically in air, springing from perch, followed by a long drawn 'tee-hoo' when nose diving.

YARKAND SHORT-TOED LARK
216. *Calandrella cinerea longipennis* (Eversmann)

1048. *Alauda longipennis* Eversmann, *Bull. Soc. Imp. Sci. Nat. Moscow* 21:219. Type-locality: Sangara, Dzungaria (Northwest China).

Local names: Pulāk (Gujarati); Pullāk, Bāgheri (Hindi).

Recognition: A small sandy-coloured sparrow-like lark with hind claw straight but short and whiter underparts contrasting with black tail; size that of the sparrow (length 150 mm). Sexes alike.

Head greyish buff with a pale supercilium and a brown patch on ear-coverts; upper

* A single bird observed in Bikaner in February 1959 (A.K.M.)

plumage pale grey, feathers broadly streaked with black; dark brown or black tail edged with fulvous; breast pale brown, or black tail edged with fulvous; breast pale-brown, streaked and bears blackish spot on each side; abdomen dull white.

Iris brown; bill horny brown above, horny yellow below; legs and feet fleshy brown.

Distribution: Winter visitor to northwestern India including the arid tracts of Haryana, Rajasthan, northern Gujarat, Kutch and Saurashtra.

Habits and habitat: Common, migrant, moves in flocks of 10-30 or more, sometimes a few hundreds; perches on ground making itself obliterated against the background; affects open, sandy and stony flats, desert wasteland, dry parched mudflats, sandy tracts along coast; food comprises mostly weed and grass seeds, also arthropods.

Voice and calls: Generally silent (during winter), sometimes emits low chirp.

SAND LARK

217. *Calandrella raytal* (Blyth)

1845. *Alauda raytal* 'Buch-Hamilton' = Blyth, *J. Asiat. Soc. Beng.* 13:962. Type-locality: Lucknow, Uttar Pradesh.

Local names: Retāl (Gujarati, Hindi).

Recognition: Resembles the Short-toed Lark but smaller; size that of the Spotted Munia (length 130 mm). Sexes alike.

Crown narrowly striped with blackish brown; a white supercilium present; upper plumage greyish sandy, streaked with dark brown; lowerparts white faintly streaked on breast; tail square, black and white.

Iris brown, bill horny brown, tipped black; legs and feet pale fleshy yellow.

Distribution: The species, extensively distributed from West Asia to Southeast Asia, represented by three subspecies of which *C. raytal adamsi* Hume exists in Punjab, Haryana and Kutch and *C. raytal krishnakumarsinghi* Vaurie & Dharmakurmarsinghi, is confined to Bhavanagar, Saurashtra.

Habits and habitat: Resident, common: keeps in flocks of 10-20 birds; affects arid and semi-arid sandy and muddy river banks and coastal mudflats, salt-pans; mainly terrestrial, runs fast along the edge of water in search of food material; food comprises insects and seeds; flies in spurts vertically and emits a soft note and then dives perpendicular to the ground; while courting, the male sings following the steps of the female; breeds from spring to autumn, principally during monsoon; nest cup-shaped made of grass, built under shrub or rock in mudflats; clutch consists of 2-3 eggs.

Voice and call: Emits short calls 'cherup-cherup' on flight and also on ground while courting.

EASTERN CALANDRA LARK
218. *Melanocorypha bimaculata torquata* Blyth

1847. *Melanocorypha torquata* Blyth, 1847. *J. Asiat. Soc. Beng.* 16:476. Type-locality: Afghanistan.

Local names: Bārā chāndul (Gujarati, Hindi).

Recognition: A gently curved thick-billed rufous lark; size that of the Common Baya (length 160 mm). Sexes alike.

Head greyish brown; a white supercilium runs from lores to the back of head; ear-coverts rufous-brown; upper plumage dark brown, feathers pale-edged; tail black, edged paler; central tail-feathers tipped white; underparts white; upper breast white and bears two large spots, lower breast fulvous, streaked with brown.

Iris brown; bill blackish, yellowish at the lower breast; legs and feet flesh-coloured.

Distribution: Northwest India, occupies the semi-arid tracts of Punjab, Haryana, Rajasthan and Kutch.

Habits and habitat: Migratory, not common in semi-desert tracts; keeps in flocks; affects barren, fallow and harvested field, parched tidal mudflats along sea-coast, runs about on ground to forage; food comprises seeds and insects.

Voice and call: Melodious call-notes.

INDIAN CRESTED LARK
219. *Galerida cristata chendoola* (Franklin)

1831. *Alauda Chendoola* Franklin, *Proc. zool. Soc. Lond.*: 119. Type-locality: Between Calcutta and Varanasi (U.P.).

Local names: Ghāghās chāndūl (Gujarati); Chāndūl (Hindi).

Recognition: A fairly large, long and powerful-billed crested lark; size more or less that of the Bulbul (length 180 mm).

Upper plumage greyish brown mottled with black; nuchal crest long, sharp, erect and pointed, quite conspicuous, each feather black in centre edged rufescent; a pale streak over the eye; wings brown, quills with a rufous patch on the inner webs; tail short, feathers brown edged buff; underparts whitish, breast fulvous, spotted or blotched with dark brown.

Iris hazel brown; bill horny grey; legs and feet brown.

Distribution: Northwestern India including the arid and semi-arid areas of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Resident, also partially migrant; keeps in pairs, sometimes in small flocks of six or seven; affects sandy wasteland also cropland and roadsides; keeps to ground

running about a lot to forage; food comprises insects and weed seeds; perches freely on branch of trees, fence, telegraphic wire, bush-tops; breeds through summer to rainy season (March to August); nests on ground in some small depression better hidden under grass-tuft or shrub; nest-made of grass and roots built by both the sexes; clutch consists of 3-4 eggs; both sexes incubate and extend care to the chicks.

Voice and calls: Emits short and pleasant song emitted on the wing. On ground normally plaintive 'tee-ur, tee-ur', sometimes imitates calls of other birds.

SYKES'S CRESTED LARK
220. *Galerida deva* (Sykes)

1832. *Alauda deva* Sykes, *Proc. zool. Soc. Lond.* 92. Type-locality: Dukhun = Deccan, South India.

Local names: Chāndūl (Gujarati).

Recognition: A rufous-brown lark characterised by a distinct pointed crest and with pectoral streaks few and narrow; a short tail. Size that of the House Sparrow (length 130 mm). Sexes alike, female with a smaller crest.

Iris hazel-brown; bill brown; legs and feet flesh-coloured.

Distribution: North and West India extending to South India including Kutch, Saurashtra and northern Gujarat, also central Rajasthan*

Habits and habitat: Resident; common; keeps in loose pairs or scattered parties; affects open, stony, scrub country and edges of dry lakes and ponds; food comprises wild grass and weed-seeds also arthropods; breeds in spring to autumn (March-September) nests on ground under shelter of grass-tuft or shrubs; nest a cup made of coarse grass and fibres; clutch consists of 3-4 eggs; both sexes incubate and extend care to chicks.

Voice and calls: Sings in variegated tunes; generally emits short whistling notes.

EASTERN SKYLARK
221. *Alauda gulgula inconspicua* Severtzov

1873. *Alauda inconspicua* Severtzov, *Vertik, Turkest. Zhivotn.* 142. Type-locality: Turkestan.

Local names: Jāl Agan (Gujarati), Bhārāt Chāndūl (Hindi).

Recognition: Much like the Indian Pipit but squat; hind claws usually very long and tail slightly pointed; size that of the sparrow (length 170 mm). Sexes alike.

*Recorded from Sambhar Lake in 1958 (A.K.M.)

Upper plumage pale sandy grey with feathers black-centred, crown bears an inconspicuous tuft; bill slender or slightly curved; underparts fulvous, abdomen whitish faintly streaked and spotted with black; wing rounded in shape; outer tail-feathers white with rufescent edges.

Iris hazel brown; bill horny brown; legs and feet flesh-coloured.

Distribution: North and West India including arid and semi-arid tracts of Punjab, Haryana, Rajasthan, Gujarat and East to Bihar.

Habits and habitat: Resident and locally migratory; infrequently met with; affects open fallowland, grassy plains, shrubby countries, generally in proximity of mudflats, coastal belt; squats low among shrubs and grass, running about in short spurts, sometime flying low in an undulating manner; food comprises small insects and weed seed; performs aerobatics in various ways, the male shoots straight up in sky, hovers and drops in steps to descend on its starting perch; breeds during summer months (June-September); nests on ground in open cultivated fields or grassland preferring depressions for nesting; nest- cup-shaped made of fine grass and roots; clutch consists of 3-4 eggs; both sexes incubate.

Voice and calls: Emits 'troo-turr-turr' when flushed. The male sings melodiously on wings while it hovers.

SIBERIAN COLLARD SAND MARTIN

222. *Riparia riparia diluta* (Sharpe and Wyatt)

1893. *Cotile diluta* Sharpe and Wyatt, *Monogr. Hirund*, 1:63. Type-locality: Chimkent, north of Tashkent, Tadzhikistan (USSR).

Local names: Pārdeshi Retāl Ābābil (Gujarati); Ābābil (Hindi).

Recognition: A smoky grey-brown swallow with a well defined collar across breast and white underparts; size that of the munia (length 130 mm). Sexes alike.

Upperparts pale brown; back and rump brownish grey; wings and tail darker; wing quills sandy grey; chin spotted and streaked; a small tuft of feathers on the back of the tarsus above hind-toe.

Iris dark brown; bill black; legs and feet dark-brown.

Distribution: Widely distributed in the Indian subcontinent including northwestern India, east to West Bengal.

Habits and habitat: Migratory; gregarious, loose flocks of a few dozens, sometimes mixed with other swallows, met along edges of tanks and irrigation canals; feeds by hawking small insects on wings; roosts in tall grass at the margin of tanks and lakes.

Voice and calls: Twittering short calls 'chit-chit' emitted while dropping to roost.

CRAG MARTIN
223. *Hirundo rupestris* Scopoli

1796. *Hirundo rupestris* Scopoli, *Annus J. Hist. Nat.* 167. Type-locality: Tyrol, Australia.

Local names: Pārdeshi Gr Abābil (Gujarati).

Recognition: A mouse-coloured martin with a square tail; tail-feathers spotted with white; size that of the House Sparrow (length 140 mm). Sexes alike.

Upperparts brown; chin spotted brown; throat whitish; underparts whitish; base of hind-toe hairy; under tail-coverts blackish.

Distribution: Throughout the hilly parts of the Indian subcontinent including hilly tracts of northern Gujarat and Saurashtra.

Habits and habitat: Migrant; rare, often mixed with other swallows; keeps usually in pairs; affects cliffs and slopes; feeds on wings; food comprises winged-insects.

Voice and calls: Often produces feeble note 'chit-chit' on wings and more when roosting.

DUSKY CRAG MARTIN
224. *Hirundo concolor* concolor Sykes

1833. *Hirundo concolor* Sykes, *Proc. zool. Soc. Lond.* 83. Type-locality: Dukhun = Deccan, South India.

Local names: Gār Ābābil (Gujarati); Chātan-ābābil (Hindi).

Recognition: A swallow-like bird with a short tail and with white spots on tail; general plumage sooty-brown; size that of the munia (length 130 mm). Sexes alike.

Iris dark brown; bill, legs and feet black.

Distribution: Almost throughout India (except northeast India) including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan* and Gujarat.

Habits and habitat: Resident; infrequently met with, usually in pairs or in small parties nearabout cliffs and old delapidated forts and ruins, generally hawking about in the manner of swallows to collect insects in air; food comprises small insects on wings; breeds from February to August, generally two broods are raised; nest, a semi-circular deep saucer of mud attached to rock-face, nest-lining of soft feathers, straw fragments and soft grass; both the sexes take part in nest construction; clutch consists of 2-4 eggs; both the sexes incubate and extend care to the chicks.

* Observed in mixed parties with swallows in Matapahar, Sambhar Lake, Nagore District in January 1958 (A.K.M.)

Voice and call: Produces soft melodious note 'chit-chit-chit' uttered while hawking.

WESTERN SWALLOW

225. *Hirundo rustica rustica* Linnaeus

1758. *Hirundo rustica* Linnaeus, *Syst. Nat.*, ed. 10, 1:191. Type-locality: Sweden.

Local names: Derāsāri Ābābil (Gujarati); Ābābil (Hindi).

Recognition: A glossy steel-blue swallow with a long forked tail; size that of the House Sparrow (length 180 mm). Sexes alike.

Forehead and throat chestnut-red; presence of a complete poectoral band; upperparts glossy blue-black; underparts pale pinkish-white; wings long; tail-streamers long; white spots on tail conspicuous in flight.

Iris dark brown; bill, legs and feet black.

Distribution: Throughout the Indian subcontinent in winter including the arid and semi-arid tracts of northwestern and western India.

Habits and habitat: Migratory, very common in winter, congregates in huge numbers, flocks gather on countryside over-hanging telegraphic wires; flies swiftly in flocks hawking insects on wings, tirelessly keeps on flight exercise gliding over meadows, reed-beds and water stretches; food comprises chiefly dipterous insects, winged-termites and ants.

Voice and calls: Often emits 'chit-chit-chit' on wings.

INDIAN WIRETAILED SWALLOW

226. *Hirundo smithii filifera* Stephens

1825. *H. (irundo) filifera* Stephens, in *Shaw's Gen. Zool.* 13:78. Type-locality: India.

Local names: Leshara Ābābil (Gujarati); Tilli-ābābil (Hindi).

Recognition: A dark steel-blue, wire-tailed, swallow with a bright chestnut cap and neck; size that of the House Sparrow (length 140 mm, excluding the wire-tail). Sexes alike except the length of the wire-tail which is shorter in female.

Upper plumage glossy steel-blue, underwing and tail-coverts dark brown; lower plumage white; inner webs of tail-feathers bear two long fine lengthened wirelike shafts.

Iris dark brown; bill, legs and feet black.

Distribution: Throughout the Indian region including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; common; gregarious; flocks near about water, generally

skimming over lakes, reservoirs, canals; perches on telegraph-wires, railings of bridges, parapets; on flight hawks winged insects; food comprises dipterous flies, minute coleoptera on wings, termites and ants; breeds from March to August; nest- a shallow cup made of mud pellets, stuck to the vertical surface of the wall or rock in a protected place near about water; nest- lined with feathers; female builds the nest; clutch consists of 3-4 eggs; female incubates; incubation period 14-15 days; both sexes nurture the young by feeding them in flight.

Voice and calls: Emits low pitched twittering note 'chit-chit' in flight, the male sometimes produces short feeble musical twittering notes 'chrrik-twit', repeated several times.

INDIAN CLIFF SWALLOW

227. *Hirundo fluvicola* Blyth

1855. *Hirundo fluvicola* Blyth, *J. Asiat. Soc. Beng.* 24:470. Type-locality: Bundelkand ex Kerdon = Bundelkhand, northern Madhya Pradesh.

Local names: બેંકહાદ-ઁબૅબિલ (Gujarati); Nahar-ġbābil (Hindi).

Recognition: Very like the Sand Martin with slightly forked tail and long and pointed wings; size that of the munia (length 120 mm). Sexes alike.

Crown dull chestnut with black shaft-streaks; upper plumage glossy steel-blue; rump pale brown; underparts fulvous-white, streaked with brown on chin, throat and breast; abdomen white.

Distribution: Greater parts of India, except wet and extremely dry regions; in northwest India found in the semi-arid regions (Punjab, Haryana, Rajasthan except western parts and Gujarat).

Habits and habitat: Resident, common; highly gregarious forming big flocks, sometimes mixed with Sand Martin; affects water-tracts, hawks about in the vicinity of water; flight feeble with lesser swoops and glides, often drinks and feeds on wings; congregates on telegraph-wires to rest; food comprises small winged-insects, specially diptera; breeds from February to April and also from July to September; nests made of clay pellets, stuck to walls, overhanging cliffs, under bridges in the vicinity of water; generally nests in clusters; nest consists of a small circular chamber communicating through a tubular mouth that sticks out from the wall; nest lined with soft grass and feathers; clutch consists of 3-4 eggs.

Voice and calls: A feeble twittering 'trr-trr' on wing; a chorus while clinging to the nest.

STRIATED OR REDRUMPED SWALLOW

228. *Hirundo erythropygia* Sykes

1832. *Hirundo erythropygia* Sykes *Proc. zool. Soc. Lond.* 83. Type-locality: Dukhun, Poona = (Pune, Maharashtra).

Local names: Kenchi Ābābil (Gujarati); Māsīd ābābil (Hindi).

Recognition: A glossy steel-blue swallow with a deeply forked tail and chestnut rump; size that of the House Sparrow (length 150 mm) minus the tail. Sexes alike.

Crown steel-blue, sides of the head mixed rufous and brown, a dark chestnut line across forehead and over the eye; a chestnut collar round the neck; underplumes of wing and tail dark-brown; outer tail-feathers elongated; underparts fulvous with ill-defined brown shaft and streaks.

Iris brown; bill brownish black; legs and feet black.

Distribution: Throughout the plains of India and the arid and semi-arid tracts of northwest India including Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Resident, fairly common; keeps in small parties or flocks during non-breeding season and spends most part of the day on wings with other swallows and martins; flight slow and deliberate, often circles fairly high or at free will up and down backward and forward; affects cultivated areas, village surroundings, market places, seldom rests on ground on trees but prefers to alight on telegraph wires or parapets of buildings as and when feels to rest; congregates in large numbers in early morning hours; roosts at dusk in tall grass; hawks winged-insects, with wider sweeps in its habitat areas during the day in small parties; food comprises small winged-beetles, small flies, ants and termites on wings; during breeding season keeps in scattered pairs; breeds from April to August; nest- a plastered mud-flat with a tubular entrance stuck against ceiling of old and dilapidated building, arches of bridges, rocky ledge; nests lined with soft grass and feathers in a bulbous egg-chamber, used year after years for egg laying; clutch consists of 3 or 4 eggs; both sexes take part in nest- building, incubation and tending the young and both roost in nest while incubating.

Voice and calls: Generally emits sparrow-like chirps.

INDIAN GREY SHRIKE 229. *Lanius excubitor lahtora* (Sykes)

1832. *Collurio Lahtora* Sykes, *Proc. zool. Soc. Lond.* 86. Type-locality: Dukhun = Deccan, South India.

Local names: Dūdhio lātoro (Gujarati); Dūdiyā or sāfed lātoro (Hindi).

Recognition: A grey and white bird with a heavy head and a hawk-like hooked bill; a conspicuous black band through the eyes; tail longish, graduated, black and white; size that of the Myna (length 250 mm). Sexes alike.

Upper plumage bluish grey; head silvery grey; wings black with a white patch; lower plumage white.

Iris dark brown; bill horny black; legs and feet black.

Distribution: Throughout the greater parts of India including the arid and semi-arid tracts of northwestern India including Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Resident; common; keeps solitary or in pairs; affects dry regions, scrubby, thorny forests, fallow-land, cultivated tracts; perches on tips of bushes, leafless top branches of stunted trees, telegraphic wires; excessively war; flight low, undulating and short, often swoops down from its perch to collect moving creatures from ground and returns to its perch to consume its prey, the victim battered and torn to pieces for devouring, often the morsel impaled on thorn to form a larder to be consumed at leisure; breeds from March to October, sometimes two broods raised; nests in thick thorny bushes; nest- a cup-shaped 8-10 cm in diameter and 6 cm deep made of twigs, grass roots, feathers, wool and cotton, and other fibrous material, erected at low heights, varying from one metre to four metres; clutch consists of 3-6 eggs; both sexes incubate and extend care to chicks.

Voice and calls: Emits grating alarm calls.

INDIAN BAYBACKED SHRIKE 230. *Lanius vittatus vittatus* Valenciennes

1826. *Lanius vittatus* Valenciennes, *Dict. Sci. Nat.*, ed. Levrault 40:227. Type-locality: Pondicherry, South India.

Local names: Pāchnāk lātoro (Gujarati); Pāchānāk (Hindi).

Recognition: A small chestnut maroon and whitish shrike with a longish tail; a broad and heavy head with a broad black band through the eye; bill heavy and notched; size that of the Bulbul (length 180 mm). Sexes alike.

A broad black band across forehead through eye to ear-coverts conspicuous; crown and upper neck grey; back and shoulders chestnut maroon; rump white; tail graduated, black and white; wings black with white mirror; abdomen white; breast fulvous.

Iris brown; bill black; legs and feet plumbeous to black.

Distribution: Almost throughout India (except wet areas) including the semi-dry areas of northwest India.

Habits and habitat: Resident and locally migrant; found solitary, occupies bush-tops, lower branches of trees or higher perches; affects open shrubby country also vicinity of cultivation; maintains a fixed foraging territory vigilantly guarded from intruders; from perch occasionally swoops down on the ground to capture its quarry and after its successful hunt flies back to its perch where the prey torn to pieces to be devoured in bits; food comprises mostly insects, also lizards and young birds; breeds from May to July, nests among thorny trees and shrubs; nest- a compact cup composed of grass, feathers, wool, rags, cotton and plastered by cobwebs outside and lined inside with soft grass; clutch consists of 4-5 eggs; both sexes incubate and extend care to the chicks.

Voice and calls: A harsh 'chuur-chur-r-r chur-r' note, at times emits pleasant warbling musical notes, mimicking songs of other birds.

REDBACKED SHRIKE
231. *Lanius collurio* Linnaeus

1758. *Lanius collurio* Linnaeus, *Syst. Nat.*, ed. 10, 1:94. Type-locality: Sweden.

Local names: Lāl-lātoro (Gujarati), Lāl-lātorā (Hindi).

Recognition: A distinctive chestnut-back shrike with a black band through the eye; size that of the bulbul (length 170 mm); female like the male but the black band through the eye duller.

The species is represented by several subspecies of which the nominate subspecies (*L. collurio collurio*) has a black tail and more white and back chestnut contrasting with ashy head and nape; the other subspecies *L. collurio phoenicuroides* (Schalow) is more brightly coloured and a rufous tail and head, nape and back pale sandy-brown and wing with a conspicuous small white patch; the subspecies *L. collurio isabellinus* Hemprich & Ehrenberg is paler, the upperplumage uniformly sandy brown but head rufous-brown and the wing patch though present but not apparently visible. All the three subspecies migrate to northwestern arid and semi-arid areas.

Distribution: The nominate subspecies (*L. collurio collurio*), an autumn migrant visits in small numbers to the western parts of West Rajasthan and North Gujarat. *L.c. phoenicuroides* is also a regular autumn migrant to North Gujarat and Kutch. *L. c. isabellinus*, a winter visitor and a passage migrant, visits plains of northwest India including Punjab, Rajasthan, Kutch and Saurashtra and semi-arid tracts in other parts of India.

Habits and habitat: Passage migrant; usually found singly; affects dry, semi-desert, lightly wooded areas, dry scrubland and cultivation; perches on open branches, bush tops, fence, telegraph wire; from perch constantly keeps an eye on the ground and around for prey and swoops down to capture the quarry from ground or in air; food comprises largely insects.

Voice and calls: A harsh call 'chr-r-r-ri' like that of the Rufousbacked Shrike

RUFOSBACKED SHRIKE
232. *Lanius schach* Linnaeus

1758. *Lanius schach* Linnaeus, *Syst. Nat.* ed. 10, 1:94. Type-locality: China, Canton area (ex Ostbeck).

Local names: Lātoro (Gujarati); Māttiya latorā, Kājālā latorā (Hindi)

Recognition: A slender, large, rufous-backed shrike with a black band running from forehead through the eyes, a long graduated tail and upper mandible notched at the tip; size between bulbul and myna (length 250 mm). Sexes alike.

Upperparts rufous-grey, head and nape pale grey; shoulders and rump bright rufous; wings black, outer primaries bear a white patch (mirror) at the base; tail blackish, tipped with rufous; lowerplumage rufous-white, more rufous on flanks and vent.

Iris dark brown or brown; bill black; legs and feet black.

The species is represented by a dozen subspecies in its range of distribution of which two, namely *L.s. erythronotus* (Vigors) and *L.s. caniceps* Blyth are concerned, the former differs from the latter in having the upperparts more or less suffused with rufous, absent in the latter.

Distribution: Oriental. A widely distributed species extending from central to south and southeast Asia. The subspecies *L.s. erythronotus* found mostly as a winter visitor to Peninsular India including the arid and semi-arid tracts of northwestern India. Some found resident in many parts and reported to breed in Kutch, Gujarat and Rajasthan. The subspecies *L.s. caniceps* is more a bird of southern parts of peninsular India but also occurs in western India including Kutch, Gujarat and Rajasthan, found to be resident and breeds.

Habits and habitat: Common, solitary, pugnacious, generally keeps singly ruling a territory of its own; perches upright on tops of bushes, poles, telegraph wires; rapacious, swoops down on its prey to pick it up from the ground or undertakes to appropriate insects on flight; larger quarries killed by striking or tearing with its sharp strong bill, holding its prey in one foot; surplus food captured or not consumed maintained as larder; food comprises largely insects as locusts, grasshopper and crickets, beetles and bees, wasps, termites, and winged ants, small rodents, birds and chicks also lizards, etc.; breeds from March to May, sometimes extended to July; more than one brood is raised; nests among thorny shrubs and stunted trees; nest-cup-shaped (70-80 mm in diameter) erected by both the sexes at a height of one to six metres; nest material composes twigs, wooly and cotton fibres, coarse grass, dry palmyra leaves in bits, hairs, feathers and rubbish lined with soft grass; clutch consists of three to five eggs; both sexes incubate and extend parental care to the chicks.

Voice and calls: A harsh exciting and alarming distress cracking call-note 'jurrick-jurrick' emitted from time to time. Definitely more noisy during breeding season; excellently mimics songs of different birds.

INDIAN GOLDEN ORIOLE 233. *Oriolus oriolus kundoo* Sykes

1832. *Oriolus Kundoo* Sykes, *Proc. Zool. Soc. Lond.*: 87. Type-locality: Dukhun = Deccan, Peninsular India.

Local names: Peelāk (Gujarati); Son-peelāk (Hindi).

Recognition: A golden yellow bird with black in wings and tail; tail rounded; female with greenish tinge; size that of the myna (length 250 mm).

Male: Upper plumage bright golden yellow; a broad line from lores through eye extending behind the eye; wings black; central tail-feathers black; underparts bright yellow.

Female: Upperparts light yellow with greenish wash; underparts pale yellow to whitish, narrowly streaked with light brown on breast; wings and tail brownish black.

Iris dark crimson; bill flesh-pink; legs and feet dark slaty blue.

Distribution: Indian subcontinent. More or less throughout India, migratory as well locally breeding in arid and semi-arid tracts of Punjab, Haryana, Rajasthan and Gujarat (including North Gujarat, Saurashtra and Kutch).

Habits and habitat: Not uncommon in groves and gardens and light forests; keeps singly or in pairs; shy and secretive; arboreal; affects taller leafy trees, sometimes descends to lower branches almost to the ground level in search of morsel; flight strong and undulating covering short distances from one garden to another; food comprises largely berries and fruits and small quantities of insects; breeds from April to August; nest built by both the sexes on forked branches; nest,- a deep cup (90 mm diameter and 60 mm deep), composes grass and fibres draped with cobwebs; clutch consists of 2-4 eggs; both sexes incubate and tend the young.

Voice and calls: Call notes melodious 'pee-lo-pee-lo'

BLACK DRONGO 234. *Dicrurus adsimilis* (Bechstien)

1794. *Corvus adsimilis* Bechstein, Latham's *Allgem Ubers. Vog.*, 2, pt. 1:362. Type-locality: South Africa restricted to Duwenshoek River, Southern Cape Province by Clancey, *Bull. Br. Orn. Cl.* 76:85.

Local names: Kālo Koshi (Gujarati), Kotwāl, Buchāngā (Hindi); Kanchh, Kalkanchh (Kutch); Kalkalichi, Kalchet (Punjab).

Recognition: A black bird with a long deeply forked tail; size that of the bulbul (length 310 mm). Sexes alike.

Plumage entirely glossy black; a small white spot below the eye; bill strong and slightly hooked; tail forked and much longer than wings; legs short.

Iris deep crimson; bill legs and feet black.

Distribution: Oriental, with several subspecies of which two viz., *Dicrurus adsimilis albirictus* (Hodgson) and *Dicrurus adsimilis macrocercus* Vieillot occur in the arid and semi-arid tracts of northwestern India, the former is found in Punjab, Haryana, Rajasthan and north Gujarat and the latter in Kutch and Saurashtra, the two subspecies differ in sizes only.

Habits and habitat: Resident, also partly migratory; keeps singly or in pairs; arboreal, perches on leafless branches in trees, telegraph wires, shrubs along bunds; affects pastures, cultivations, forest-edges, groves and gardens; pugnacious and courageous, attacks and chases intruders fearlessly in its territory; forages in open country, follows grazing cattle to collect disturbed insects, often rides on the back of them; carnivorous, food comprises largely insects, terrestrial as well as winged; sometimes appropriates small lizards and hatchlings of birds; breeds from April to August, sometimes raises two broods; nests on leafless forked branches; erects a broad shallow cup made of tiny twigs, fine grasses and fibrous material; both sexes take part in nest building, incubation and care of chicks; clutch consists of 3-4 eggs.

Voice and calls: Emits harsh metallic double notes 'callkanchit, callkanchit', also chatters, while chasing intruders becomes over-excited and noisy.

ROSY PASTOR
235. *Sturnus roseus* (Linnaeus)

1758. *Turdus roseus* Linnaeus, *Syst. Nat.*, ed. 10, 1:171. Type-locality: Lapland. Switzerland.

Local names: Vaiyo (Gujarati); Gūlābi-tilyer (Hindi); Wyha, Waheeo, Wyho (Kutch).

Recognition: A rose-pink myna with a crest on head; size that of the myna (length 230 mm). Sexes alike.

Head and neck glossy black with a long black crest, finely spotted with white and has a purple and green metallic sheen; upper breast black; wings pointed and black; upper and under tail-coverts black, edged with white; tail black.

Iris brown; bill brownish yellow, basal half black; legs, feet and claws horny brown.

Distribution: Indian subcontinent. Almost throughout India in winter, more common in northwest India including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan, and Gujarat (North Gujarat, Saurashtra, Kutch).

Habits and habitat: Migratory, winters from August to April; gregarious; abundant, moves in large flocks sometimes swarms in cultivated fields, affects plains specially standing crop, grassland; perches in trees; often seen following cattle like cattle egrets and mynas; food comprises largely insects, specially hoppers, locusts, crickets, beetles, caterpillars, grubs, also fruits, berries, grains, nectar and drinks in pools and puddles, also wets its feathers in such waters.

Voice and calls: Chatters while feeding, sings typical starling songs at roost, producing discordant grating noises and melodious warbling notes specially on return migration.

COMMON INDIAN STARLING
236. *Sturnus vulgaris poltaratskyi* Finsch

1878. *St (urnus) poltaratskyi* Finsch, *Proc. zool. Soc. Lond.* 713. Type-locality: Markakul, Eastern Kazakhstan, U.S.S.R.

Local names: Kālo Vāiyo (Gujarati); Tilorā, Tilyār Mynā, Khusnāi (Hindi).

Recognition: A small dark brilliantly glossy starling, spotted finely with buff; size that of the Common Babbler (length 200 mm); sexes alike, female duller.

Winter plumage, above glossy black with metallic sheen of green; head, throat and ear-coverts glossed with purple; feathers of upper plumage faintly tipped with buff; wings brown edged with black; tail brown; head, neck and breast bear hackles; underparts black with a glossy reflection.

Iris brown (male), outer ring cream yellow, inner dark brown (female); bill pinkish yellow, base of the upper mandible horny steel (male), horny yellow (female); legs and feet pinkish brown; claws darker.

Distribution: Palaearctic, winter visitor to northwestern India and the Gangetic plains, including the arid and semi-arid tracts of northern and western India (Punjab, Rajasthan, North Gujarat, Saurashtra and Kutch).

Habits and habitat: Migratory, gregarious, assembling in large flocks; affects countryside grassland and cultivation; keeps mostly perched in trees and feeds actively in cultivation in company of other starlings and mynas, often follows grazing cattle; food comprises insects and grubs, spiders, also fruits and berries.

Voice and calls: Emits mixed notes of chattering, whistling and mimicking calls of other birds.

COMMON MYNA

237. *Acridotheres tristis tristis* (Linnaeus)

1766. *Paradisea tristis* Linnaeus, *Syst. Nat.*, ed. 12, 1:167. Type-locality: Pondicherry, South India.

Local names: Kabar (Gujarati); Desi Myān (Hindi).

Recognition: A vinous-brown bird with a yellow patch of naked skin below and behind eye conspicuous; size somewhat larger than the bulbul (length 230 mm). Sexes alike.

Head, neck and upper breast glossy black; feathers of crown narrow and shiny black and greyish brown; upper plumage glossy vinous brown, primaries of wings dark brown with a large white patch; tail black, tipped white; white of the wing and tail conspicuous in flight.

Iris reddish brown mottled with white; bill yellow, base of the lower mandible brownish green; legs and feet yellow; claws horny.

Distribution: Indian subcontinent. Throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident, very common, abundant in market areas, a commensal associated with human habitation; keeps in pairs, family parties, sometimes congregating in large numbers; terrestrial as well as arboreal; affects plains and hilly country, both urban and rural areas, as well as forests; roosts in trees sharing the space with crows, parakeets and other mynas and starlings; forages generally in pairs in cultivated fields, gardens, bazar areas and in trees; omnivorous, food comprises cultivated seeds and fruits, generally collects food-stuff from stubbles; grapes, flower, nectar, arthropods, mainly insects, also spiders, scorpions, small vertebrates, tit-bits of kitchen refuse, including fish and meat scraps; breeds from March to September (generally June to August): nests in trees, in holes in walls, ledges, cornice of buildings, ceiling of human dwellings; raises two broods, sometimes more; nest material consists of twigs, leaves, rootlets, fibres, human hair and rubbish; clutch consists of 4-5 eggs; both the parents share incubation, incubation period 16-18 days.

Voice and calls: A harsh alarm call 'chake-chaake' sometimes gurgles loud notes 'redoo, redoo, redoo' or soft 'churr-churr'; can mimic calls of others birds.

BANK MYNA

238. *Acridotheres ginginianus* (Latham)

1790. *Turdus ginginianus* Latham, *Index Orn.* 1:362. Type-locality: Gingee South Arcot, Tamil Nadi.

Local names: Shiraji kabar (Gujarati); Gang Mynā (Hindi).

Recognition: Like the Common Myna except for the colour of wattle and general plumage bluish grey insted of brown; size, slightly smaller than the myna (length 210 mm). Sexes alike.

Crown and sides of head black, wattle red; forehead tufted; upper plumage slaty grey; wings black; base of the primaries bear a patch of pinkish buff; tail-tips buff; throat, chin and breast slaty grey; centre of abdomen pinkish buff.

Iris red; bill orange-yellow; naked skin below and behind eye brick-red; legs and feet yellow.

Distribution: Indian subcontinent, found throughout northwest and northern India, south to a hypothetical line drawn from Bombay to Orissa.

Habits and habitat: Resident and local migrant; not uncommon; found in pairs or small flocks; affects human habitation, in and around market places, godowns, roadsides, railway stations; irrigated fields, often associated with cattle in ploughed land; food comprises insects, spiders, fruits, cultivated grain; breed from June to September; often raises two broods; colonial nesting; nests in holes, excavated by the bird in the riverside banks, well or walls of dugout pits, tunnelled up to one metre deep and five cm in diameter. Nests at the terminal end of the tunnel which composes grass, fibres, feathers, wool and rubbish; clutch consists of 3-5 eggs.

Voice and calls: More or less like the Common Myna but low-pitched.

WESTERN TREE PIE

239. *Dendrocitta vagabunda pallida* (Blyth)

1846. *Cr. (ypsirina) pallida* Blyth, *J. Asiat. Soc. Beng.* 15:30. Type-locality: Galkund, Surat Dangs (Gujarat).

Local names: Khakedo (Gujarati); Māhālāt, Mōōtri (Hindi).

Recognition: A long graduated tail, rufous magpie with ochraceous belly and short, stout, slightly curved bill; size that of the Rose-ringed Parakeet (length 300 mm). Sexes alike.

Head and neck dark sooty grey; body plumage bright rufous, mantle isabelline; wing-coverts greyish white; wings dark brown; central tail-feathers elongated, tail-feathers tipped black; breast sooty brown; abdomen cinnamon-brown.

*The type locality 'Gingee' is out of range of distribution of the species it appears that Latham had either obtained the bird in captivity or had found an escapee (A.K.M.).

Distribution: Indian subcontinent, Western India including Rajasthan, Gujarat and Saurashtra.

Habits and habitat: Resident, common; arboreal; found in pairs, sometimes in parties; shy but very inquisitive like crows; affects groves and gardens in open country and thin forest; flies from tree to tree, prefers to live amidst thicker foliage; flight combines wing-flapping, sailing, gliding and dipping; omnivorous, food comprises arthropods, specially insects on wings, frogs, lizards, and snakes; eggs and nestlings of birds, fruits and berries; breeds from April to June; nests in trees, preferably thorny trees; large shallow cup-shaped nests made of large twigs, roots, grass, straw, erected on forks of top branches; clutch consists of 4-5 eggs; both sexes incubate and tend the chicks.

Voice and calls: A loud melodious call 'kookley' or 'kong-kong' repeated several times, also emits a raucous note 'kitter kitter'

INDIAN HOUSE CROW 240. *Corvus splendens splendens* Vieillot

1817. *Corvus splendens* Vieillot, *Nouv. Dict. d' Hist. Nat.* 8:44. Type-locality: Bengal.

Local names: Kāgdo (Gujarati); Kāwwā (Hindi).

Recognition: A glossy black bird with a broad grey collar, underparts ashy grey; bill stout; nostril covered by stiff straight bristles; size-slightly larger than the pigeon (length 430 mm). Sexes alike.

Head black masked; upper plumage black highly glossed with purple, blue and green; tail glossy blue-black, slightly rounded.

Iris, bill, legs and feet black.

Distribution: Indian subcontinent. Throughout India including the arid and semi-arid areas of northwestern India.

Habits and habitat: Resident, very common; gregarious; excessively inquisitive, wary and alert; essentially a bird of human habitation, found in urban and rural areas, even near temporary camps in desert areas, also seen in forest areas specially affecting colonies of breeding birds; very social, congregates in large numbers while roosting or in places where food available; attracts members of other parties by calling and flocking; omnivorous, food comprises refuse of all kinds, bird's eggs and chicks; sick small rodents and squirrel,* insects specially grasshoppers and locusts, beetles and caterpillars, also sprouting grain, fruits in orchards; maintains sanitation by consuming carcass, sharing with vultures; breeds from April to August; nests in forks of trees; poles, ledges of buildings; nest-a large platform made of sticks and twigs, metal wires, ropes, rags, cellulose papers and soft material, generally shaped saucer-like; mating rarely exhibited, takes place in nests or on ground; clutch consists of 4-5 eggs; both sexes take

*Found capturing a sick subadult palm squirrel from the foot of a tamarind tree at Nagore, Nagore District (A.K.M. 1959).

part in nest-building, incubation and tending the chicks; incubation period 16-18 days; brood often parasitized by cuckoos.

Voice and calls: Normally 'caw-caw'; while relaxing produces a guttural sound 'kurrr' and during courting emits 'kree-kree' notes.

PUNJAB RAVEN

241. *Corvus corax subcorax* Severtzov

1872. *Corvus subcorax* Severtzov, *Vertik. Turkest. Zhivotu*: 115. Type-locality: Northwest and southeast Turkestan.

Local names: Māhākāg (Gujarati); Domkāk (Hindi).

Recognition: Like the Jungle Crow but much larger; size, somewhat smaller than the Pariah Kite (length 690 mm). Sexes alike.

Plumage entirely black, glossed with steel-blue, purple and lilac sheen; bill stout and massive; throat bears short but conspicuous hackles.

Iris dark brown; bill, legs and feet black.

Distribution: Indian subcontinent. Northwestern India including the arid tracts of western Rajasthan, Punjab and Kutch.

Habits and habitat: Locally resident, common in western Rajasthan, uncommon elsewhere; keeps in pairs, sometimes in small loose parties; affects outskirts of towns and villages; prefers dry and barren places and low hilly tracts; flies fast, strong and straight, moderately low over the ground; gives company to vultures at carcass; omnivorous, food comprises carrion, offal, insects, frogs, lizards, chicks and small wounded birds, rodents, standing grain in cultivations, scraps refuse; pairs for life; breeds from December to March; both sexes cooperate in nest-building; nest-a large shallow saucer made of sticks and lined with soft material of wool, cloth, hair, fur and feathers erected on forks of trees on stunted thorny trees; clutch consists of 4-5 eggs; both sexes incubate and tend the chicks; incubation period 17-18 days.

Voice and calls: Call distinctive; utters deep 'pruk-pruk' notes, also emits crocky voice.

INDIAN JUNGLE CROW

242. *Corvus macrorhynchos culminatus* Sykes

1832. *Corvus culminatus* Sykes, *Proc. zool. Soc. Lond.* 96. Type-locality: (Dukhun = Poona = Pune, Maharashtra).

Local names: Girnāri kāgdo (Gujarati), Kālā kowwā, Jungli kowwā, Dhāl kowwā (Hindi).

Recognition: An entirely black crow with a heavy black bill; size between House Crow and Pariah Kite (length 480 mm). Sexes alike.

Entire plumage glossy black washed with dark purple blue.

Iris dark brown; bill and legs black.

Distribution: Indian subcontinent, confined to Indian Peninsula except the arid zone of northwest India, the Himalayas and eastern India. Found in Saurashtra, South and Central Rajasthan forested areas but extremely patchy.

Habits and habitat: Resident, met singly or in pairs but concentrate in good number on carcass; affects deciduous and dry deciduous forests, also temple and bazar areas in the vicinity of forests where it flocks for foraging; food comprises carrion, insects, lizards, chicks, and small mammals also standing crop of sorghum, millet and wheat, and kitchen refuse; breeds from March to May; nest on forks of large trees, also on stunted trees of Babul (*Acacia* sp.). nest-a large saucer-shaped, made of sticks and twigs, lined with fibrous material, grass, etc.; clutch consists of 4-5 eggs; incubation period 18 days; both sexes build the nest, incubate and tend the young.

Voice and calls: Emits a raucous and guttural call 'caw'; call tone sometimes harsh and at times melodious, also in flight emits a long drawn 'quaww' with outstretched wings.

SIND WOOD SHRIKE

243. *Tephrodornis pondicerianus pallidus* Ticehurst

1920. *Tephrodornis pondicerianus pallidus* Ticehurst, *Bull. Br. orn. cl.* 41:56. Type-locality: Larkana, Sind.

Local names: Kānto Lātoro (Gujarati); Keroulā (Hindi).

Recognition: A grey bird with a conspicuously broad dark eye-streak running from lores to ear-coverts below the eye and a pale eye-brow; size that of the bulbul (length 160 mm); sexes alike.

Upper plumage greyish brown; tail square, tail-feathers dark brown except for the white outer pairs; lower plumage ashy; female with a pale eye-streak.

Iris yellowish brown; bill blackish brown, darker towards the tip; legs and feet horny brown.

Distribution: Indian subcontinent. The whole of northwestern India including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan, Gujarat and Kutch.

Habits and habitat: Resident, common; quiet; keeps in pairs; arboreal; affects trees and bushes in open areas, also groves and gardens moving from tree to tree in search of morsel; food comprises mostly insects, also spiders; breeds from February to June; nests in trees; nest-a shallow neat and compact cup composed of soft bark and fibres and grass stems bound together with cobwebs and lined by wool, hair and feathers; generally prefers forks of 2 to 10 meter height for nest erection in which both the sexes participate; clutch consists of 2-4 eggs; both sexes incubate and tend the chicks.

*Observed a pair at Matapahar temple precincts in Jan. 1957 about 10 km west of Sambhar Lake, also a few scattered parties in the Aravallis in Nathdwara, Udaipur District, Rajasthan, Jan. 1958. (A.K.M.)

Voice and calls: Emits a sweet and distinctive whistle 'wheet-wheet; followed by short and quick notes 'whi-whi-whi-whi'

WEST HIMALAYAN LONGTAILED MINIVET
244. *Pericrocotus ethologus favillaceus* Bangs & Phillips

1914. *Pericrocotus brevirostris flavillaceus* (Sic) Bangs & Phillips, *Bull. Mus. Comp. Zool. Harvard Univ.* 58:293. Type-locality: Kulu valley (Kulu valley, Himachal Pradesh), northern India.

Local names: Chhotā pāhāri bulbulchāsm (Hindi).

Recognition: A small black and scarlet bird with a conspicuous red wing-patch (male), female black and yellow with a yellow throat; size that of the bulbul (length 180 mm).

Male: Crown and upper plumage glossy black; throat black; red of wing-patch extends to the outer -webs of secondaries; tail graduated, black and red; upper tail-coverts red.

Female: Red in male replaced by yellow; yellow on the head restricted to forehead only.

Iris brown; **bill** black; **legs and feet** black.

Distribution: South palaearctic, migrates to the plains of northern and central India, also straggles to Rajasthan and Gujarat.

Habits and habitat: Migratory, winter visitor, infrequently met with but always in parties of a dozen or two; arboreal, prefers tall flowering tree-tops, moving quickly from one tree to another; food comprises small arthropods, tender buds, flower and leaves, also very small fruits.

Voice and calls: Chatters more or less like a tit 'mini-weet, mini-twee-tit'

SIND SMALL MINIVET
245. *Pericrocotus cinnamomeus pallidus* Baker

1920. *Pericrocotus cinnamomeus pallidus* Baker, *Bull. Br. orn. Cl.* 40:115. Type-locality: Larkana, Sind Pakistan.

Local names: Rājālāl (Gujarati); Bulbulchāsam (Hindi).

Recognition: A dull coloured, long-tailed small bird with a flame-coloured patch on the rump and wing; size-somewhat smaller than the sparrow but with a longer tail (length 150 mm).

Male: Upperparts light grey; throat grey; rump orange-red; wings blackish brown with orange-yellow central patch; tail deeply graduated, black above, central pair of feathers broadly tipped with orange-red; abdomen white.

Female: Upper plumage paler; central patch on wings duller, yellow diminished; tail as in male but tips paler; lower plumage white tinged with yellow.

Iris brown; **bill**, **legs and feet** horny brown to black.

Distribution: Indian subcontinent, found throughout northwestern India except for treeless desert terrain of western Rajasthan.

Habits and habitat: Resident; fairly common in plains; arboreal; affects scrubby semi-desert areas and dry deciduous light forested country; flits in small parties (6-12 individuals) often exhibiting aerobatics to captivate winged-insects and also flutters and hovers to collect insects from branches, tree trunks, barks, shrubs and clumps of thorn; food comprises small insects, larvae and spiders; generally raises two broods, breeds in spring from March to April and in autumn (September-October); nest-a small well bound shallow neat cup (5 cm diameter) made of fine twigs, grass, feathers; generally prefers horizontal forks of branches for erecting nests; clutch consists of 2-3 eggs; female only incubates but both the parents tend the chicks.

Voice and calls: Utters low, pleasant whistling notes 'shoewee-shoewee'

WHITEBELLIED MINIVET

246. *Pericrocotus erythropygius erythropygius* (Jerdon)

1840. *Muscicapa erythropygia* Jerdon, *Madras J. Lit. Sci.*, 11:17. Type-locality: South India (= Ajanta, Aurangabad District, Maharashtra).

Local names: Kābāro Rajālāl (Gujarati); Sāfed Bulalchasam, Sāfed-Rajālāl (Hindi).

Recognition: A pied minivet with red rump and breast (male), black replaced by smoky grey (female); size that of the House Sparrow with a longish tail (length 150 mm).

Male: Upper plumage glossy black; wings bear a white patch forming a 'V' shaped design; rump orange-red; upper tail-coverts black; tail black and white; breast orange-red; abdomen white.

Female: Forehead white; head grey; upper plumage brownish grey; lower plumage white; rump more white and less orange.

Iris brown to dark brown; bill dark brown; legs and feet horny brown.

Distribution: Indian subcontinent. Occupies the greater parts of the Indian peninsula including the drier parts of Punjab, Rajasthan, Kutch, Saurashtra and north Gujarat.

Habits and habitat: Resident, infrequently met with, keeps in parties of 4-6 individuals; affects arid and semi-arid scrubby and bushy country studded with thorny trees and shrubs; also grassy patches; keeps an erect posture on perch; behaves more or less like a wagtail in flight and foraging; forages among grass and weeds by hovering and dropping into such situation; food comprises minute insects and spiders; during non-breeding period the male and female form separate groups but during breeding period move in mixed groups; breeds from June to September; nests in stunted trees and shrubs; nests made of fine grass; twigs, grass-roots, rapped externally by cob-webs; forks of trees about two or three metres above ground preferred for nesting; both sexes participate in nest building; only the female incubates, the male constantly supplies food to the female during incubation; both the parents extend care to the chicks.

Voice and calls: Emits short soft notes 'cheep, cheep' very similar to that of munia, also

of the wagtail 'tseep -tseep, at times sings a short sweet song.

CENTRAL INDIAN IORA
247. *Aegithina tiphia humei* Baker

1922. *Aegithina tiphia humei*, Baker, *Fauna Brit. India* (Birds) 1:342. Type-locality: Raipur, Raipur, District, eastern Madhya Pradesh.

Local names: Shobinga (Gujarati); Shaubeega, Shoubeegi (Hindi).

Recognition: A little greenish yellow arboreal bird with conspicuous white bar on dark wings; size that of the sparrow (length 140 mm).

Male (in summer): Head and back black mixed with yellow; rump greenish yellow; feathers soft and copious; wings rounded and black, bears two white bars, quills narrowly edged with yellow; underparts yellow.

In winter upper plumage light greenish yellow; underparts bright yellow; tail black.

Female: Upper plumage greenish yellow; underparts yellow; wings dark brown with a greenish tinge and feathers edged with greenish white; tail greenish yellow.

Iris cream-yellow; bill slaty blue; black along culmen; legs and feet slaty blue.

Distribution: Indian subcontinent, confined to central parts of peninsular India including western and southwestern Rajasthan,* Saurashtra and northern Gujarat.

Habits and habitat: Resident, keeps in pairs; affects mixed deciduous forest, scrub jungles, groves nearabout human habitation and cultivation; forages among foliage, very thoroughly searches all parts of plants; food comprises small insects, grubs and larvae; breeds in July-August; during breeding period the male displays aerobatics by springing in air and then drops down in spirals on its perch spreading all its feathers, also emitting notes like a cricket and when perched spreads its tail broadly like a fan and the rump feathers are puffed out; prefers to nest in forks of thorny trees at a height between 2-4 metres; both the sexes take part in nest building; nest -a small cup composed of dry leaves, fine grass, fine grass-roots and fibrous material solidly plastered with cobwebs; prefers forks of bush or of trees; both sexes incubate; incubation period 14-15 days; both the sexes tend the chicks.

Voice and calls: Produces notes 'chit-chit' also high and low whistles.

MARSHALL'S IORA
248. *Aegithina nigrolutea* (Marshall)

1876. *Iora nigrolutea* Marshall, *Stray Feathers*, 4:410. Type-locality: Meerut, Meerut district, western Uttar Pradesh.

*Observed at Mandore, Jodhpur and Pokhran -(A.K.M.) January 1983.

Local names: Marshall-no-Shobinga (Gujarati); Shaubeegi (Hindi).

Recognition: A bright golden coloured greenish yellow bird suffused with white on wings and tail; size that of the sparrow (length 140 mm).

Male: Upper plumage bright golden yellow mixed with black; rump greenish yellow; tail black, broadly tipped with white; under-parts bright golden yellow.

Female: Upper plumage greenish yellow; black and white on wings; tail same as in male.

Iris dark brown; bill, legs and feet plumbeous.

Distribution: Indian subcontinent, confined to north, west and central India including the drier parts of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Resident, common; met with in pairs; affects wooded country, foliage and branches of trees and bushes, scrub jungles, groves and gardens; food comprises largely small insects, caterpillars, larvae and spiders; breeds from June to August; nuptial display, nesting and breeding similar to the Central Indian Iora; nests in low thorny shrubs; nest sanitation, carried by the parents.

Voice and calls: Emits short musical chirrup 'wheet-wheet' also mellow whistles like the Quaker Babbler, sometimes produces harsh alarm notes similar to Wood Shrike.

RAJASTHAN REDWHISKERED BULBUL 249. *Pycnonotus jocosus abuensis* (Whistler)

1931. *Otocomposa jocosus abuensis* Whistler, *Bull Br. orn. Cl.* 52:40. Type-locality: Mount Abu, Rajasthan.

Local names: Sipūhi Būlbūl (Gujarati); Kamera Bulbul, Pāhāri-Būlbūl (Hindi).

Recognition: A dark brown bird with a pointed black crest and a white patch on cheeks; a crimson tuft below the eyes and below the base of the tail; size that of the Redvented Bulbul (length 200 mm). Sexes alike.

Upper plumage brown; wings and tail darker; tail tipped with white except the central tail-feathers; a black band on the sides of the breast; underparts white.

Iris brown; bill and legs black.

Distribution: Indian subcontinent, confined to Rajasthan except the north and west districts, also northern Gujarat.

Habits and habitat: Resident; infrequently met with; keeps in pairs, sometimes in small parties; affects scrubs and cultivated tracts, groves and gardens; flight strong and well sustained; perches on tree-tops and also on bush tops; forages among bushes and scrubs, often descending to the ground; food comprises fruits, berries, arthropods specially insect larvae; breeds from

*Observed in Pali, Pali District, Rajasthan, Kailana Lake, Jodhpur District, (A.K.M.) 1960.

March to July, sometimes in autumn (September-October); in courtship display the male incessantly bows and postures before the female and also spreads its tail and drops its wings and gently flutters and quivers the same and produces a low moaning call 'croak' Nest-cup-shaped, made of twigs, grass, roots, fibres, wrapped by cobwebs; nest erected in bush at a height of two metres and above from the ground; clutch consists of 2-3 eggs; two broods generally raised; both sexes build the nest, incubate and tend the chicks.

Voice and calls: Emits melodious musical notes 'be quick-be-quick', also alert signals 'kripki-kripaki'.

WHITE-EARED BULBUL

250. *Pycnonotus leucogenys leucotis* (Gould)

1836. *Ixos leucotis* Gould, *Proc. zool. Soc. Lond.* 6. Type-locality: Karachi, Sind, southern Pakistan.

Local names: Jogido (Kutch); Kānārā Būlbūl (Gujarati); Kushāndrā (Gurmukhi).

Recognition: A dull brown bulbul with a conspicuous white patch on either side of the face and a patch of yellow undertail; crest absent; size that of the Common Myna (length 200 mm). Sexes alike.

Whole head, chin, throat and nape black; white patch on ear-coverts conspicuous; upper plumage olive-brown; underparts pale brown to olive-brown; lower abdomen whitish; tail dark brown, tipped white except the central tail-feathers; patch below the tail saffron-yellow.

Iris brown; bill black; legs and feet steel-grey.

Distribution: Indian subcontinent, confined to northern and western India including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan, Gujarat, Kutch and northern parts of Madhya Pradesh.

Habits and habitat: Resident and local migrant; common; keeps in pairs or in small parties of 4-6 individuals in promising foraging areas and also during breeding season; affects grass bushes, scrubs, hedgerows, gardens and coastal belt; very lively; restless; constantly flicks its tail, flying with all agility from tree to tree and bush to bush in search of morsel; food comprises largely berries, fruits, seeds and nectar, winged and terrestrial insects, spiders; breeds from April to September; raises two broods; nest-a small cup, well-built with grass, stems, vegetable fibres, lined with soft grass placed in low branches of thorny trees and shrubby bushes; clutch consists of 2-3 eggs; incubation period 12 days; female incubates; nest jealously guarded by both the sexes.

Voice and calls: Emits melodious calls 'pity for you' 'quick'-a trip with you', when agitated, chatters.

CENTRAL INDIAN REDVENTED BULBUL

251. *Pycnonotus cafer humayuni* Deignan

1951. *Pycnonotus cafer humayuni* Deignan, *Auk* 68:110. Type-locality: Bhilbhil (Kutch); Bulbul (Gujarati); Bulbul, Kala-bulbul (Hindi).

Local names: Bhilbhil (Kutch); Būlbūl (Gujarati); Būlbūl, Kālā-bulbul (Hindi).

Recognition: An earthy ground bulbul with a black crest and a bright red patch under the base of the tail; size that of the Common Myna (length 200 mm) but slender. Sexes alike.

Head and throat black; upper plumage brown; wing feathers edged with whitish; underparts pale white; tail brown, rear portion almost black; tips white.

Iris dark brown; bill and legs black.

Distribution: Indian subcontinent, confined to western and northern India limited to the river Jamuna in the east.

Habits and habitat: Resident, fairly common; keeps in pairs and small parties (4-6); mostly arboreal; affects groves and gardens, thorny bushes, trees and cultivated tracts, light forested areas; food comprises fruits and berries, also insects on wings and caterpillars; damages fruits and flowers, and standing crop to a great extent; breeds from March to September; in courtship display the male spreads out its wings and lifts up above the head, then flutters them up and down, tail also spread out but lowered; nest -a compact grass cup cemented with cobwebs lined with grass roots, twigs and shoots of other fibrous plants generally placed in shrubs, bush thickets, hedges, and stunted trees at a height of a metre or two above the ground; clutch consists of 2-3 eggs; incubation period 14 days; both the sexes build the nest, incubate and tend the chicks.

Voice and calls: Emits repeated melodious note 'Qrick, Qrick' also produces alarm notes 'Quick-wik'

MOUNT ABU SCIMITAR BABBLER

252. *Pomatorhinus horsfieldii obscurus* Hume

1872. *Pomatorhinus Obscurus* Hume, *Str. Feath*, 1:7. Type-locality: Mount Aboo, southwest Rajasthan.

Local names: Vapi Laledo (Gujarati).

Recognition: A pale smoky grey bird with a long and large bill; size that of a slender myna (length 220 mm). Sexes alike.

Upper plumage dark brown, reddish brown on sides; underparts white; a white supercilium present extending from bill to neck; flanks and under tail-coverts dark grey-brown.

Iris brown to crimson; bill yellow, blackish at the base; legs and feet greenish grey.

Distribution: Indian subcontinent, confined to the woodlands of western India including the Aravalli hill ranges (southwest Rajasthan), northern Gujarat and the Gir Forest (southeast Gujarat), south as far as the Tapti river; South Rajasthan (Bhilwara)*

Habits and habitat: More or less confined to the hills covered with thorny jungle, scrubs, deciduous and dry deciduous forests; frequently met with; a skulker, keeps in pairs, sometimes in company of other babblers; terrestrial, hops on ground among shrubby and thorny forest floor cover; food comprises insects and spiders, and vegetable matter berries and seeds; breeds from April to July; nest-round, dome shaped, made of grass blades, leaves, rootlets and bark-strips interlaced and placed in thick bushes, about a metre above the ground; clutch consists of 3-5 eggs; both sexes take part in nest building and incubation.

Voice and calls: Emits shrill notes 'crow cant' or 'cry-cry-crow-crow'

RUFOUSBELLIED BABBLER

253. *Dumetia hyperythra abuensis* Harington

1915. *Dumetia albigularis abuensis* Harington, *J. Bombay nat. Hist. Soc.* 23:429. Type-locality: Mount Abu, southern Rajasthan.

Local names: Karmamadi Laledo (Gujarati).

Recognition: A small olive-brown and rufous bird with a short curved bill; size that of the munia (length 130 mm). Sexes alike.

Head reddish brown; sides of face bright fulvous; throat white; upper plumage olive-brown; tail olive-brown, cross-rayed; underparts bright rufous.

Distribution: Indian subcontinent, confined to southwest and central Rajasthan, northern Gujarat and Saurashtra in the west and as far south as Pune (Maharashtra) along the Western Ghats.

Habits and habitat: Resident, common skulker; keeps in parties of 4-8 individuals; affects forest undergrowth, scrub jungles, tall grass-tufts; party members follow one another while foraging from bush to bush and with slight alarm disperse and disappear; food comprises insects, seeds and fruits; breeds from May to September; nest globular, made of coarse grass and rootlets lined with fine grass, placed low above the ground in thick cover near just dried rivulets where green vegetation persists; clutch consists of 3-4 eggs.

Voice and calls: A low short whistle 'cheep -cheep' while on move, also emits harsh tittering notes 'truk -truk'

*Observed 3-4 individuals in a light forest in Deogarh, Bhilwara District among thorn and shrub complex. February 1983. (A.K.M.).

WESTERN YELLOWEYED BABBLER
254. *Chrysomma sinense hypoleucum* (Franklin)

1831. *Timalia hypoleuca* Franklin, *Proc. zool. Soc. Lond.* 118. Type-locality: Between Calcutta and Banaras = Uttar Pradesh, restricted by Ticehurst 1922 (Further restricted to Varanasi, Uttar Pradesh).

Local names: Piliankhovalo Laledo (Gujarati); Bārā-podnā, Bārā-piddā, Gotāl (Hindi).

Recognition: A small brown bird with a fairly long tail, black bill and orange eyelides; size between sparrow and bulbul (length 180 mm). Sexes alike.

Distribution: Indian subcontinent, confined to northern and western India (except desolate desert areas), as far east as eastern Uttar Pradesh and south to the Tapi river in the West and northwestern parts of Madhya Pradesh.

Habits and habitat: Resident, fairly common in scrub jungles; shy, skulks in thick cover; keeps in pairs, sometimes in small parties; affects undergrowth of open forests, scrub jungle mixed with tall grass; patch of bushes and nearness to water, concealing among reeds in hills and plains; food comprises insects, larvae and spiders also berries; breeds from June to September; nest-compact, conical, made of grass-blades, fibres, wrapped with cobwebs and lined with fine grass and root, erected about a metre or two above the ground on forks of stunted trees or hedges, also suspended in grass stems in thickets; clutch consists of 4-5 eggs; both sexes incubate and tend the chicks.

Voice and calls: A loud call note 'cheep-cheep-cheep-cheep' and during breeding season emits a short melodious note 'kitch-kivichee-whit-chu'

COMMON BABBLER
255. *Turdoides caudatus caudatus* (Dumont)

1823. *Cossyphus caudatus* Dumont, *Dict. Sci. nat.* (ed. Levrault) 29:268. Type-locality: India.

Local names: Sheradi (Gujarati); Chilchil, sor, Gengā, Dumri (Hindi).

Recognition: A brown bird with a graduated tail, conspicuously streaked above, whitish below; size that of the Common Myna or slightly larger (length 230 mm). Sexes alike.

Upper plumage drab brown to fulvous, each feather streaked with dark brown; tail olive-brown, closely cross-barred; underparts creamy buff; chin and throat dull white.

Iris yellowish brown; bill brown above, yellow below; legs and feet pale yellow.

Distribution: Indian subcontinent, practically all over India except the humid parts of eastern India.

Habits and habitat: Resident; common; keeps in parties of 6-12 individuals; a skulker, keeps to the ground; affects light forest, open bush country, fallowland, cultivation, gardens, semi-arid scrubby terrian, generally restricted to plains and low hilly country; members of the

party move about actively, hopping and exploring areas in search of morsel and with least suspicion, members get disorganized, taking low weak flight individually one by one from one cover to another; food comprises mainly insects and spiders, also grains, berries and nectar; breeds from February to September; generally raises two broods; nest-a cup, thickly walled, made of fine thorny twigs, coarse and fine grass-stems, roots, lined with fine rootlets and hair, erected above a metre high, well concealed in thick bush or shrub, placed mostly in the centre of thorny xerophytic plants; clutch consists of 3-4 eggs; incubation period two weeks; both sexes incubate, take part in nest-building, and tend the chicks. Nest often parasitized by cuckoos specially the Piedcrested Cuckoo (*Clamator jacobinus*) from June to September.

Voice and calls: Emits pleasant whistling trills 'krich-krich-krii-ri-ri', when alarmed start disorderly chorus.

LARGE GREY BABBLER 256. *Turdoides malcolmi* (Sykes)

1832. *Timalia malcolmi* Sykes, *Proc. zool. Soc. Lond.* 88. Type-locality: Pune, Maharashtra.

Local names: Laledo (Gujarati); Ghogoi, Gāugāi, Sātbhāi (Hindi).

Recognition: A dusky grey bird with broadly white-edged long tail; size that of the myna (length 280 mm). Sexes alike.

Upper plumage dusky brown with feathers having a dark shaft; forehead ashy grey with fine white shaft-stripe; wings dark brown; chin and throat white with a pinkish tinge; underparts fulvescent-grey; tail pale brown, graduated and central feathers cross-rayed, three outer pairs white and next pair edged with white.

Iris bright yellow; bill horny brown; legs and feet brownish.

Distribution: Indian subcontinent, spread over greater parts of Peninsular India, riverine plains of Ganga in northern India, eastern and southern Rajasthan and Gujarat.

Habits and habitat: Resident, common; gregarious, keeps in parties of 6-12 individuals; affects dry forests, open country and gardens; skulker, keeps under cover of bushes and creepers, also in trees; feeds on ground among dry leaves; quite bold to challenge intruding predators and raises alarm squeaks which gets all individuals together; party members often quarrel among themselves and in fight they get interlocked with their claws unsettled for a long time; food comprises insects, spiders, seeds, berries; breeds from March to October; community nesting quite frequent; nest-cup-shaped, made of fine roots, sticks, dry grass, thorny twigs, erected at a height of 1-3 metres in thorny tree or in shrub; clutch consists of 3-4 eggs; nest often parasitized by the Hawk Cuckoo (*Cuculus varius*) and the Piedcrested Cuckoo (*Clamator jacobinus*); both the sexes incubate and tend the chicks.

Voice and calls: Generally emits 'kray-kray-kray' and when suspicious raises hysteric squeaky calls.

SIND JUNGLE BABBLER

257. *Turdoides striatus sindianus* (Ticehurst)

1920. *Crateropus terricolor sindianus* Ticehurst, *Bull. Br. orn. Cl.* 40:156. Type-locality: Karachi, Sind, southern Pakistan.

Local names: Vāñā lāledo (Gujarati); Sātbhāi (Hindi).

Recognition: A dingy greyish white bird with a whitish head, dark brown throat and breast and white eyes; size that of the Common Myna (length 250 mm). Sexes alike.

Upper plumage ashy brown, mantle streaked with brown and white; wings rounded, dark brown; lowerparts creamy buff, throat and breast-feathers edged with grey; upper tail-coverts and rump greyish; tail longish and bushy, posterior half of the tail dark brown.

Iris creamy white; bill light yellow, gape commisure bright yellow; legs and feet pale yellow.

Distribution: Indian subcontinent confined to northwest India including Punjab, Haryana, Rajasthan (except Thar desert), northern Gujarat.

Habits and habitat: Resident, common, patchily located, gregarious, keeps in parties of 6-12 individuals, restricted to a territory; affects wooded areas, low bushes, shrubs, grassland and cultivation; very noisy while foraging on the ground among fallen leaves and under bush; very alert while feeding, keeping a sentinel on a tree; often flies up into the tree when suspicious; flight slow-a few labourious strokes and glide; food comprises insects, spiders, seeds and berries; breeds from April to October; a large cup-shaped nest loosely made of twigs, grass, rootlets built in low bushes and clumps of thick spiny shrub; clutch consists of 3-4 eggs; both sexes take part in nest building, incubation and tending the chicks.

Broods often parasitized by the Pied Crested Cuckoo (*Clamator jacobinus*) and the Hawk Cuckoo (*Cuculus varius*).

Voice and calls: Emits a squeaky call 'ke-ke-ke', also chatters loudly.

SPOTTED FLYCATCHER

258. *Muscicapa striata sarudnyi* Snigirewski

1928. *Muscicapa striata sarudnyi* Snigirewski, *J.F. Orn.* 76:595, new name for *Butalis griseala* var. *pallida* Zarudny 1903, nec *Muscicapa pallida* Müller. Type-locality: Eastern Iran and Transcaspia.

Local names: Khākhi Mākḥimār (Gujarati).

Recognition: A non-descriptive small dusky brown, whitebreasted flycatcher, resembles more or less the Yellowthroated Sparrow; size that of the House Sparrow (length 130 mm). Sexes alike.

Upperparts pale brown; forehead and throat whitish, streaked and spotted; underparts whitish, breast streaked darker; tail brown, slightly forked.

Iris brown; bill, legs and feet black.

Distribution: South-West palaeartic, winter visitor to northwestern India including western Rajasthan, northern Gujarat, Kutch and Saurashtra.

Habits and habitat: Migratory; infrequently met with; solitary and shy; affects foliated trees, bushes, cultivation and open forest; perches upright in exposed position on slender branches or wires preferring lower branches; flight quick, frequently darts out to capture insects on wings and returns to the point of start; food comprises winged insects, also minute insects and larvae from plants and ground.

Voice and calls: A loud and distinct squeaky note 'tick-tick', sometimes 'tzee-tzee'

WESTERN REDBREASTED FLYCATCHER

259. *Muscicapa parva parva* Bechstein

1794. *Muscicapa parva* Bechstein, *Allg. ueber Vog.* 2:356. Type-locality: Thuringerwald, West Germany.

Local names: Chātki Mākḥimār (Gujarati); Turra (Hindi).

Recognition: A small brown non-descriptive bird with pale buff underparts; throat and breast of male red, female buffy; white patches of the tail displayed by erecting and flicking; size that of the munia (length 130 mm).

Upper plumage brown; crown ashy; sides of the head bluish grey wings dark brown; tail blackish with basal two-thirds whitish.

Iris brown; bill brown; legs and feet dark brown.

Distribution: Palaearctic, winter visitor to northwestern, western and central India including Rajasthan, North Gujarat, Saurashtra and Kutch.

Habits and habitat: Migratory (September-March); found singly; shy and secretive; arboreal; affects foliated trees in jungles, groves, gardens and cultivations; restless, moves from bough to bough constantly flitting the tail, darting from its perch to hawk flying insects or picking up insects from ground and returning to its perch; food comprises dipterous insects, minute beetles and other winged-insects; pugnacious, fights among their own kind.

Voice and calls: Emits a harsh trilling whistle 'thewee-thewee-thewee' and a soft rapid note 'tick, tick-chirrr'

TICKELL'S BLUE FLYCATCHER

260. *Muscicapa tickelliae tickelliae* (Blyth)

1843. *C(yornis) Tickelliae* Blyth, *J. Asiat. Soc. Beng.* 12:941. Type-locality: Central India (= Barabhum, Purulia District, W. Bengal).

Local names: Adhārāṅga (Gujarati).

Recognition: A dark blue flycatcher with reddish throat and breast; base of the bill wide and flattened, fringed with long hairs; size that of the munia (length 140 mm).

Male: Upper plumage dark blue, sides of the head darker; wings black with a blue tinge; tail black washed with blue; throat and breast dull orange-red; under tail-coverts and abdomen whitish.

Female: Slightly paler than the male.

Iris brown; bill, legs and feet black.

Distribution: Indian subregion, found throughout India excluding arid areas of North and West India but found in central and eastern Rajasthan, Gujarat and Kutch.

Habits and habitat: Resident but locally migratory; not uncommon in well-foliaged forest, groves and gardens, also along shaded forest streams, dry ravines supporting vegetation along their course; arboreal, flits among branches to hunt insects on wings, also undertakes sorties from perch to ground and back with captured insects; food comprises small insects specially flies, mosquitos and beetles; breeds from May to August; nest-a neat cup made of dry leaves, lined with fine grass-roots, erected in a small hole or hollow at the base of a tree or banks of streams, preferring vertical walls, sometimes in rocky cavities; clutch consists of 3-4 eggs.

Voice and calls: A short metallic continuous note 'chik-click' at intervals.

VERDITER FLYCATCHER

261. *Muscicapa thalassina thalassina* Swainson

1838. *Muscicapa thalassina* Swainson, *Nat. Library*, Flycatchers 21:252. Type-locality: India.

Local names: Piroji Mākhimār (Gujarati).

Recognition: A blue flycatcher with black patch in front of eyes; size that of the House Sparrow (length 150 mm).

Male: Upper plumage blue-green with a tinge of bronze; head and throat bright verdigris.

Female: Duller and greyer.

Iris dark brown; bill, legs and feet black.

Distribution: Palaearctic, found all over India except the extreme arid part of northwestern India.

Habits and habitat: A winter visitor; common; solitary or in pairs; affects trees in forest areas, groves and gardens, in plains as well as in hills; perches on exposed situation, on bare branches at tree-tops or telegraph wires and from perch swoops into air to hawk insects on their

wings and then moves to another perch with its captured prey; flight very strong and swift; food comprises tiny insects specially diptera.

Voice and calls: Utters sharp 'trick-trick' moving tail up and down.

NORTHERN WHITEBROWED FANTAIL FLYCATCHER

262. *Rhipidura aureola aureola* Lesson

1830. *Rhipidura aureola* Lesson, *Traite -d' Orn.* 290. Type-locality: Bengal.

Local names: Nāchāṇ (Gujarati); Māchhāryā, Nāchān, Chākdil (Hindi).

Recognition: A whitebrowed black and white fantail flycatcher; size between sparrow and bulbul (length 130 mm).

Male: Upper plumage brown; wing coverts tipped with white; forehead white; supercilium white and broad; crown blacker than back; feathers of cheeks and chin whitish; throat black edged with white; tail black, outer feathers white and except the central feathers rest tipped with white; underparts white, sides of the breast black.

Female: Paler head; browner above.

Iris dark brown; bill, legs and feet brownish black.

Distribution: Indian subcontinent, found in greater parts of India, restricted to the river Mahanadi in southeast and limited to Goa in the Western Ghats; totally absent from Thar desert but found in semi-arid areas of Rajasthan*, and Gujarat wherever deciduous forest, groves and gardens occur.

Habits and habitat: Resident, common; keeps singly or in pairs; sometimes in loose parties of 4-6; affects open country, light forests, shaded places in proximity of water; arboreal, bold and restless; flits from one branch to another; the round fan of the tail displayed when it turns from side to side on its perch, attains erect or depressed postures of the tail from time to time; hawks minute insects on wings; breeds from May to August; generally two broods reared; nest-cup-shaped, small, made of grass and fibres wrapped with cobwebs, lined by soft fibres wrapped with cobwebs, lined by soft fibres tucked to an overhanging branch or horizontal fork; clutch consists of three eggs; both sexes share nest-building, incubate and tend the chicks.

Voice and calls: Emits pleasant melodious whistling, high to low pitch notes 'chee-chee-chick-chuck', from time to time 'chuck-chuck'

*Observed in the Salt Superintendent's Bungalow at Gudah, Sambhar Lake January 1959 (A.K.M.).

PENINSULAR INDIAN PARADISE FLYCATCHER

263. *Terpsiphone paradisi paradisi* (Linnaeus)

1758. *Corvus paradisi* Linnaeus, *Syst. Nat.* ed. 10, 1:107. Type-locality: Chandannagore, West Bengal, India

Local names: Dudhrāj, Tārwārio (Gujarati); Shāh Bulbul, Sūltān Būlbūl (Hindi).

Recognition: A white or chestnut streamlined bird with a crest and a long-ribbon like graduated tail; size that of the Bulbul (length 200 mm + streamers 500 mm).

Male: (Full adult): Head black glossed with dark blue; body and tail white; tail sharply graduated, central pair of feathers exceeding the body length including the head; upper plumage faintly streaked with black and wings and tail feathers conspicuously black shafted; breast ashy grey; belly white.

Female and young male: Head and neck bluish black; upper plumage, wings and tail bright chestnut; neck collared; chin, throat and upper breast ashy grey; belly white. Intermediate stages of plumage quite common irrespective of sex.

Iris brown; eye-rim slaty blue; bill cobalt blue; legs and feet greyish blue. Feet too short and weak for terrestrial movement.

Distribution: Indian subcontinent, confined to western and South India including the arid tracts of western Rajasthan, northern Gujarat Saurashtra.

Habits and habitat: Resident, also locally migratory; arboreal; found in small parties or pairs; shy; keeps to high branches; affects light deciduous and dry deciduous forests in arid and semi-arid areas as well as in coastal belt. Also found in groves and gardens, thorny thickets along shady thickets of rivulets and nullahs; flight undulating from tree to tree through light and shades with its trailing long streams; swoops down from branches to hawk insects on wings and returning to the same perch; food comprises exclusively insects; breeds from April to August; two broods generally raised; noisy during nest-building; courting conspicuous which involves wing beats and gracefully raising of tail and singing; nest-neat and compact cup made of grass and fibres, leaves and moss, plastered with cobwebs and lined by soft fine grass and hair, placed 2-12 metres high on a twig or stem of a tree, fairly exposed; clutch consists of 3-4 eggs; both sexes build the nest and incubate.

Voice and calls: Emits sharp grating note 'chek' 'chechwe' sometimes sings like a warbler 'peety-to-whit'

RUFOUSFRONTED WREN-WARBLER

264. *Prinia buchanani* Blyth

1844. *P. (rinia) Buchanani* Blyth, *J. Asiat. Soc. Beng.* 13:376. Type-locality: Jalna, northwestern Hyderabad, India.

Local names: Lālbhalni fūdki (Gujarati); Sūrkhī-fūtki (Hindi).

Recognition: A Tailor Bird-like brown bird with reddish head and white belly, and a long

tail, edged with white; size that of the munia (length 120 mm). Sexes alike.

Upper plumage reddish brown, crown rusty reddish; a conspicuous supercilium present; tail brown, graduated, tail-feathers faintly crossbarred, also tipped and edged with white (except the central pair) preceded by a dark spot; underparts white; sides of breast and belly washed with fulvous.

Iris reddish orange; bill brown; legs and feet pale brown.

Distribution: Indian subcontinent, confined to arid and semi-arid regions of India including Punjab, Haryana, Rajasthan, North Gujarat, Kutch and Saurashtra.

Habits and habitat: Resident and local migrant; fairly common; keeps in small scattered parties; arboreal as well as terrestrial; movement on ground like that of the Common Babbler; affects arid scrub jungles, thorny bushes spread over plains, grassland, broken and stony terrain, and forest undergrowth; very active, moves from bush to bush, scanning from ground to the top of bushes; food comprises insects, specially soft insects and larvae; breeds from March to September; nest -round, purse-shaped, made of grass and cobwebs and lined with fine grass and rootlets, attached to a twig of thorny bush about half to a metre high above the ground, generally placed in the central part of the bush; clutch consists of 4-5 eggs.

Voice and calls: A monotonous song 'cheeret-cheeret-cheerat'

INDIAN STREAKED WREN-WARBLER

265. *Prinia gracilis lepida* Blyth

1844. *P. (rinia) lepida* Blyth, *J. Asiat. Soc. Beng.* 13:376. Type-locality: Indus territories (= Sind.)

Local names: Vid fūdki (Gujarati); Khār-phitki (Hindi).

Recognition: A small sandy brown bird with a longish tail-a diminutive Common Babbler; size that of the munia (length 130 mm). Sexes alike.

Upper plumage fuvlous, streaked finely with dark brown; crown, nape and back streaked finely with dark brown; lores and round the eye whitish; tail graduated, finely barred, tipped whitish, with a subterminal dark band; underparts pale buff.

Iris brown; bill blackish (summer); brown (winter); legs and feet pale fleshy brown.

Distribution: Indian subcontinent, confined to dried parts of western and northern India including southern Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Resident, common; keeps in pairs; affects scrubs and tall grass (*Saccharum* sp.); tamarisk, in open country and fairly light forest, cultivated tracts with scattered small trees; habits combine those of the Tailor Bird, Leaf Warbler and Reed Warbler; actively forages in grass and bushes, sometimes hunting on ground; food comprises chiefly insects also spiders; at perch flicks its wings; flight jerky, short and undulating; breeds from March to September; generally two broods raised; nest-small, oval-shaped, with a lateral entrance; nest

made of fine dry grass and vegetable fibres wrapped with cobwebs and silk, closely resembles that of the Tailor Bird; bushes of long grass or thorny bush preferred for nesting, nest tucked to one or two leaves at a height of one to two metres from ground level; both sexes take part in nest-building, but the male puts more labour, lining and finishing done by the female; both sexes incubate, incubation period 13 days; both sexes tend the brood.

Voice and calls: Emits a feeble twittering call, sometimes wheezy reeling note.

NORTHWESTERN PLAIN WREN-WARBLER

266. *Prinia subflava terricolor* (Hume)

1874. *Drymoipus terricolor* Hume, Nest and Eggs of Indian Birds, 349. Type-locality: Agra, Western Uttar Pradesh.

Local names: Deshi Fūdki (Gujarati); Phūtiki (Hindi).

Recognition: An earthy brown small bird with a pale longish graduated tail; size that of the munia (length 130 mm). Sexes alike.

Upper plumage sandy brown; a narrow pale supercilium; tail feathers faintly barred, outer tail-feathers whitish; underparts pale buff to cream.

Iris yellow, eyes encircled by whitish feathers; bill black; legs and feet brown.

Distribution: Indian subcontinent, confined to northwestern India including Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Resident and locally migratory; fairly common; keeps in pairs or small parties; affects stony and sandy tracts, thorny scrub jungles and grassland, also standing cultivated crop; flits among grass and bushes with jerks and tail constantly flicking up and down; food comprises small insects and flower nectar; breeds from July to October; nest-a round ball or pear-shaped, open at the top, made of grass strips; nest attached to lower branches of trees or shrubs, sometimes to several shoots of millets; more than one brood raised; clutch consists of 4-5 eggs; both sexes incubate, incubation period 11-12 days; both sexes tend the brood.

Voice and calls: Emits alarm call 'kit-kit' also plaintive 'chee-chee-chee' notes.

NORTHWESTERN JUNGLE WREN-WARBLER

267. *Prinia sylvatica insignis* (Hume)

1872. *Drymiopus Insignis* Hume, *Stray Feath.* 1:10. Type-locality: Mount Abu, northern Gujarat.

Local names: Kāntni Fūdki (Gujarati); Tot-Rungi (Hindi).

Recognition: A light grey-brown bird with a fairly long tail, a dark head and rufescent rump; size that of the munia (length 150 mm). Sexes alike.

Upper plumage greyish brown; a narrow white supercilium present; a grey patch on face;

rufescent rump distinct, brighter than back and upperparts; tail brown, cross-rayed and margined with white (except the central tail-feathers); a dark subterminal band present; underparts buffy white (in summer), reddish (in winter).

Iris pale brown; bill black (upper mandible), yellow (lower mandible); legs and feet fleshy brown.

Distribution: Indian subcontinent, confined to western Rajasthan, northern Gujarat, Kutch and Saurashtra.

Habits and habitat: Resident, common; seen singly or in pairs; affects thorny bushes, *Euphorbia* clusters, hedges and scrub jungles supported by sandy waste and stony, broken country; food comprises insects and larvae; breeds from June to October; nest-oval-shaped, with entrance on the side, made of grass-strips, wrapped and cemented with cobwebs, erected in low bush or clumps of grass, well hidden and camouflaged; clutch consists of 3-4 eggs; both sexes take part in nest-building, incubation and tending the brood.

Voice and calls: Triple note repeatedly emitted.

INDIAN TAILOR BIRD

268. *Orthotomus sutorius guzuratus* (Latham)

1790. *Sylvia guzurata* Latham, *Index Orn.* 554. Type-locality: Gujarat.

Local names: Tāshko Dārjidoō (Gujarati); Dārzee, Phūtki, Pididi (Hindi).

Recognition: A little olive-green bird with a rufous cap and a long pointed tail, carried erect over the back, and bill sharp and long; size that of the munia (length 130 mm). Sexes alike.

Upper plumage yellowish green; forehead rufous; crown and sides of head ashy brown; a concealed dark spot on each side of the neck; underparts whitish; thighs rufous; tail brown, central tail-feathers long and pointed in breeding male, less pointed in female.

Iris reddish yellow; bill brown (upper mandible), pale flesh-coloured (lower mandible); legs and feet fleshy red.

Distribution: Indian subcontinent, the subspecies *guzuratus* is found throughout India except eastern and northeastern India.

Habits and habitat: Resident, keeps singly or in pairs; affects grassy and shrubby undergrowths, hedges, groves and gardens, forests and light scrub jungles; a skulker; hops from one slender branch to another in bushes, flitting from tree to tree and one vegetational patch to another, foraging among leaves and twigs; food comprises largely insects also nectar of flowers; breeds from April to October; nest-made of cotton, wool, soft feathers and fine grass, placed in a cavity, more or less globular, formed by stitching two or three leaves, broad enough, with fine long grass, cobwebs or cocoon silk or cotton; sometimes a single broad leaf rolled to form a nest; clutch consists of 3-5 eggs; both sexes incubate, incubation period 12 days; parents tend the chicks.

Voice and calls: Emits a loud alarm call 'twich-twich' as it flits from bush to bush.

INDIAN GREAT REED WARBLER

269. *Acrocephalus stentoreus brunnescens* (Jerdon)

1839. *A. (grobates) brunnescens* Jerdon, *Madras J. Lit. Sci.* 10:269. Type-locality: Carnatic near Trichnopoly = Tiruchirapalli, Tamil Nadu.

Local names: Pān -tiktiki (Gujarati); Pān Podna (Hindi).

Recognition: A longish shrike-like brown bird with a conspicuous supercilium, a thick bill and a short graduated tail; size that of the bulbul (length 190 mm). Sexes alike.

Upperparts olive-brown; supercilium buffish white; wings and tail dark brown with olive wash; chin and throat whitish; underparts creamy white or fulvous.

Iris yellowish brown; bill dark brown, base of the lower mandible yellowish, legs and feet dark grey to greyish brown.

Distribution: Indian subcontinent confined to northwestern India including Punjab, Haryana, Rajasthan and Gujarat (watered areas in the arid and semi-arid tracts supporting reedy vegetation), spread out almost throughout India.

Habits and habitat: Winter visitor; keeps singly or in loose groups; a skulker; affects reed-beds and rushes standing in water along canals, lakes and river-beds, also in thin desert bush; a fast flier, moves from one patch of reeds to another keeping to thick reeds; food comprises largely insects (Orthoptera-mantids, grasshoppers) also spiders.

Voice and calls: Emits loud racacous notes 'kraa' 'crick-crick-Q-we', sometimes a single note 'chuck'

BLYTH'S REED WARBLER

270. *Acrocephalus dumetorum* Blyth

1849. *Acrocephalus dumetorum* Blyth, *J. Asiat. Soc. Beng.* 18:815. Type-locality: Calcutta, India.

Local names: Pān-tiktiki (Gujarati); Podnā, Tiktiki (Hindi).

Recognition: Almost like the Great Reed Warbler but smaller; size that of the sparrow or less (length 130 mm). Sexes alike.

Upper plumage olive-brown; supercilium pale buff; wings and tail brown, primaries tinged with olive; underparts pale buff; chin and throat paler.

Iris brown; bill-upper mandible dark grey, lower pale brown; legs and feet brown.

Distribution: Indian subcontinent, widespread throughout the Indian Peninsula in winter including the arid and semi-arid areas of Rajasthan and Gujarat.

Habits and habitat: Migratory, winters from November to March; keeps singly; affects bushes of *Acacia* spp and undergrowth of shrubs in desert areas and in less arid parts, keeps to tamarisks, also in shady groves and gardens, cultivations, hedgerows; forages in thickets by hops; food comprises insects and spiders.

Voice and calls: A harsh note 'shack' followed by 'chur -r-chur-r-r'

PADDYFIELD WARBLER

271. *Acrocephalus agricola agricola* (Jerdon)

1845. *Sylvia (acrocephalus) agricola* Jerdon, *Madras J. Lit. Sci.* 13:131. Type-locality: Neighbourhood of Nellore, Tamil Nadu.

Local names: Kamodno Tickticki (Gujarati); Dhān-tickticki (Hindi).

Recognition: A little reed warbler of russet colour; size that of the munia (length 130 mm). Sexes alike.

Upper plumage rufous-brown and a reddish brown patch above the tail; a buffy white supercilium present; chin white, rest of the underparts buffy white.

Iris brown; bill dark brown above, pale fleshy below; legs and feet greyish brown.

Distribution: Palaearctic, found throughout India in winter including the wetter areas in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Winter visitor (from autumn through winter to spring); fairly common; sedentary; affects marshy reeds along canals, river beds, lakes, ponds, flooded fields, also shore-vegetation, and high grasses and sedges; flight jerky and hurried among reed covers, sometimes close to the ground; food comprises small marsh insects.

Voice and calls: Emits monotonous note 'chik-chik' while roosting as well as it takes off for a flight.

MOUSTACHED SEDGE WARBLER

272. *Acrocephalus melanopogon mimicus* Madarsz

1903. *Luscinola mimica* Madarsz, *Vorlauf neu. Rohrsanger* (a leaflet). Type-locality: Transcaspia and Seistan (= Tedjen in Transcaspia and Khorsan and Seistan in Iran).

Local names: Snvetanena Pān Tiktiki (Gujarati).

Recognition: A black-capped rufous brown small bird, with a white supercilium; size that of the House Sparrow (length 150 mm). Sexes alike.

Forehead to nape black, feathers edged with rufous; a demarcating reddish brown collar and a white conspicuous supercilium; upper plumage rufous brown, streaked with dark brown;

wings and tail brown, edged with rufous; throat and upper breast white; underparts buffy white.

Iris brown; bill greenish brown; legs and feet olive-brown.

Distribution: Palearctic, winters in northwest and northern India, limited to the River Narbada in the South; more common in the wetter areas of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Winters in plains from August to March; keeps singly; skulker; affects thick patches of reeds and bushes standing in water creeping up to the top of vegetation at dusk and dawn; hunts floating insects by creeping down the stems to reach water level to predate; food comprises aquatic insects.

Voice and calls: Emits a sharp note 'chuck' at intervals.

INDIAN BOOTED WARBLER 273. *Hippolais caligata rama* (Sykes)

1832. *Sylvia Rama* Sykes, *Proc. zool. Soc. Lond.* 89. Type-locality: Dukhun (= Deccan, India.)

Local names: Rāma-Fūdki (Gujarati); Khāki-Fūdki (Hindi).

Recognition: A small unobtrusive bird of brown colour, with a square tail, flat bill and three weak rectal bristles; size that of the munia (length 120 mm). Sexes alike.

Upper plumage brown with a wash of olive; a pale cream-coloured supercilium present; wings and tail darker, outer tail feathers, distinctively edged with whitish; throat and underparts of abdomen whitish, remaining underparts pale buff.

Iris olive-brown; bill dark brown above, yellowish brown below; legs and feet greyish brown.

Distribution: Palearctic, winters almost all over India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Migratory, winters from October through March, found singly and in scattered flocks up to a dozen; affects shrubs, bushes, scrub jungles in arid and semi-arid areas; arboreal; forages among leaves of thorny trees and shrubs, skulking in the undergrowth or moving from branch to branch, examining under leaves of thorny *Acacia* and *Prosopis*; food comprises insects and spiders.

Voice and calls: Emits a subdued notes 'chuck-chuck' or chur-chur'

ORPHEAN WARBLER 274. *Sylvia hortensis jerdoni* (Blyth)

1847. *C. (urruca) Jerdoni* Blyth, *J. Asiat. Soc. Beng* 16:439. Type-locality: Southern India.

Local names: Mōtō shvetā kānthā (Gujarati)

Field recognition: A white-throated grey warbler with a black cap in male and grey in female; size between the sparrow and the bulbul (length 150 mm).

Male: Upper plumage grey-brown; forehead, crown, nape and feathers below eye black; tail blackish brown, outer tail-feathers white; chin and throat white; underparts buff-white.

Female: Browner; forehead, crown and feathers below eye grey.

Iris greyish white and a white ring round the eye; bill dark brown or black; legs and feet olive-brown to dark slaty grey.

Distribution: Palaearctic, spreads out throughout India in winter, (except northeast India) including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan, North Gujarat, Saurashtra and Kutch.

Habits and habitat: A winter visitor (November to March); common; found mostly in babul (*Acacia* spp.), Khejra (*Prosopis* spp.); a skulker; hunts among foliage keeping to bushes and lower branches of trees and sometimes on ground to hunt insects; food comprises insects, berries and flower nectar.

Voice and calls: Produces a melodious short note 'kuch-kuch' during foraging movement otherwise silent in winter.

INDIAN WHITETHROAT

275. *Sylvia communis icterops* Ménétriès

1832. *Sylvia icterops* Ménétriès, *Cat. Rais. Caucase*: 34. Type-locality: Talych, eastern Transcaucasia, USSR.

Local names: Bhārāti Shvetā Kanthā (Gujarati).

Recognition: A small but heavy-looking red-brown bird with bright yellow eyes, and a long tail for its size; slightly smaller than the House Sparrow (length 140 mm). Sexes more or less alike.

Upper plumage ashy grey, more dark on the head; wings brown with chestnut markings, wing-feathers fringed with rufous; outer web of the outer tail-feathers white; chin and throat white; breast, abdomen and flanks white with a pinkish wash.

Adult female: Crown less grey.

Distribution: Palaearctic, visits northwest India including the arid tracts of Punjab, Haryana, Rajasthan, North Gujarat and Kutch, and western Saurashtra.

Habits and habitat: Autumn migrant (Autumn-September), no return journey through India; seen moving stealthily from branch to branch; keeps in large flocks while migrating; affects dry broken country, cultivated tracts, keeping to low scrubs and hedgerows along forest

borders, dry river beds and nullahs; food comprises largely insects, also berries.

Voice and calls: Silent on route within Indian limits.

DESERT LESSER WHITETHROAT

276. *Sylvia curruca minula* Hume

1873. *Sylvia minula* Hume, *Str Feath.* 1:198. Type-locality: Bhawulpore (= Bahawalpur, Pakistan.)

Local names: Bhārāti Nāno Shveta Kāntha (Gujarati).

Recognition: A diminutive form of the Indian Brown Whitethroat but slender dark crown and cheeks, and throat white; size that of the munia (length 120 mm). Sexes alike.

Upper plumage pale sandy brown; crown and nape brownish grey; wings dark brown, edges of wing feathers paler; tail dark brown, outer feathers white; chin and throat white; breast, abdomen and flanks dirty white to buff.

Iris pale yellow; bill steel grey; legs and feet plumbeous.

Distribution: Palearctic, visits northwest India including the arid tracts of northwest India.

Habits and habitat: Winter visitor (October to March); keeps singly, in small parties when on passage; affects scrub, thorny bushes, babul (*Acacia* sp.) and *Prosopis* spp., light thorny jungles spread out over rocky and desert terrain; creeps about among foliage to forage; food comprises insects, caterpillars, spiders and flower-nectar.

Voice and calls: Emits soft notes 'tek-tek', also sings in feeble and low tune 'chivychirri-chivychirri' with the advent of spring.

DESERT WARBLER

277. *Sylvia nana nana* (Hemprich & Ehrenberg)

1833. *Curruca nana* Hemprich & Ehrenberg, *Symb. Phys. Avium*, fol. cc. Type-locality: Sinai, Arab Republic of Egypt.

Local names: Rānā fūdki (Gujarati).

Recognition: A sandy brown rufous chat-like bird with a white ring round eye, rufous rump and tail-coverts and feathers of tail white and brown, tail often cocked and fanned out; size that of the munia (length 110 mm). Sexes alike.

Upper plumage pale sandy grey or grey-brown; underparts creamy white; upper tail-coverts reddish and feathers with dark shaft-stripes; tail dark brown, outer feathers white, central pairs tipped white; underparts creamy white.

Iris light golden yellow; bill creamy yellow; legs and feet straw yellow.

Distribution: Palaearctic, a winter visitor to northwest India including the arid tracts of Haryana, Rajasthan and Kutch.

Habits and habitat: Migratory, arrives in early October and remains till March; keeps singly; affects scattered xerophytic and scrubby bushes growing in dry desolate rocky and sandy desert belt and sandy coastal areas; a skulker, flits from bush to bush, often perches on bush tops; food comprises mainly insects.

Voice and calls: Feeble pleasant musical note 'tiri-tityu-tyu-tyuyu' produced while resting on ground or roosting in bushes.

BROWN CHIFFCHAFF
278. *Phylloscopus collybita tristis* Blyth

1843. *P. (hylloscopus) tristis* Blyth, *J. Asiat. Soc. Beng.* 12:966. Type-locality: Calcutta.

Local names: Jāl Kitkit (Gujarati).

Recognition: A little brown bird with olive tinge above; a white supercilium and a small yellow shoulder patch on the edge of the closed wings; rump olive-brown; underparts dull olive-buff; size, smaller than the munia (length 100 mm). Sexes alike.

Iris dark brown; bill dark brown; legs and feet brownish black.

Distribution: Palaearctic, winters in northern and central plains limited to Bombay in the West and Orissa in the East, also the semi-arid areas of Rajasthan and Gujarat.

Habits and habitat: Migratory, winters in the plains from September to April; common; keeps singly or in twos, sometimes in small parties; affects marshy as well as scrubland; prefers reeds and sedges growing in water, groves of babul (*Acacia* spp.), ber (*Zizyphus* spp.) and Tamarisk nearabout water, also thorny shrubs and trees in cultivated tracts; very active, makes short spurts searching insects in leafy trees, flits from bush to bush, flicking wings and tail restlessly, sometimes sallies into air to capture insects on wings also clings sideways on a reed standing in water to pick up floating aquatic insects; food comprises tiny insects, beetles, bugs, dipterous insects and larvae.

Voice and calls: Emits repeated musical notes 'chi-wit, chi-wit-twit.'

OLIVACEOUS LEAF WARBLER
279. *Phylloscopus griseolus* Blyth

1847. *Ph. (ylloscopus) griseolus* Blyth, *J. Asiat. Soc. Beng.* 16:443. Type-locality: Banks of the Hoogly River, near Calcutta (= Culcutta.)

Local names: Sādo Kitkit (Gujarati).

Recognition: A little brown tree-creeping warbler with a conspicuous orange-yellow

supercilium; size that of the purple Sunbird (length 100 mm). Sexes alike.

Upper plumage earthly brown, wing-bar absent; underwing coverts and axillaries rusty-buff; rump tinged with olive; tail-feathers brown, outer tail-feathers tipped white; throat and breast buff-yellow, abdomen more yellow.

Iris brown; bill brown above, yellow below; legs and feet brown to light brown.

Distribution: Palearctic, found almost throughout India including the arid and semi-arid tracts of Rajasthan and Gujarat.

Habits and habitat: Winters from October to March, starts visiting as early as August and leaves as late as April; met with singly, sometimes in pairs; affects large trees, creeping up and down trunks and branches, sometimes descending to the ground for collecting morsel; food comprises small insects, larvae, mostly bugs and beetles.

Voice and calls: Sparrow-like call 'quick, quick'

DULL GREEN LEAF WARBLER 280 *Phylloscopus torchiloides nitidus* Blyth

1843. *Ph (ylloscopus nitidus)* Blyth, *J. Asiat. Soc. Beng.* 12:965. Type-locality: Vicinity of Calcutta(= Calcutta).

Local names: Kitkit (Gujarati).

Recognition: A small white-eye-like olive-green bird with a bright yellow supercilium and a pale brown line behind the eye; size that of the Sunbird (length 100 mm). Sexes alike.

Upper plumage dull olive-green, rump brighter; wings brown; two yellow wing-bars; tail brown edged with olive-green; underparts yellowish white.

Iris dark brown; bill blackish brown above, horny yellow below; legs and feet greyish brown.

Distribution: Palearctic, found throughout India in winter including the arid and semi-arid tracts of northwest India.

Habits and habitat: Migratory, common large flocks start arriving in October and November and return by March; keeps singly; affects babul (*Acacia* spp.) and mixed thorny forests; actively creeps about in the foliage trees, foraging among leaves, flicking wings and making sorties to catch insects on wings; food comprises mostly dipterous insects, also beetles and insect larvae.

Voice and calls: Emits repeated squeaky notes 'si-chiwee-sichiwee-chiwee'

RUFIOUS CHAT

281. *Erythropygia galactotes familiaris* (Ménétrières)

1932. *Sylvia familiaris* Menetries, *Cat. Rais. Caucase*: 32. Type-locality: Kura, southern Caucasus, Armenia, U.S.S.R.

Local names: Rakhodi peeth (Gujarati).

Recognition: A sandy brown bird, much resembles the Rufous Shrike, but in behaviour and habits much like the Indian Robin; rump rufous and tail chestnut tipped black and white; size between the sparrow and the bulbul (length 180 mm). Sexes alike.

Head sandy brown with a conspicuous supercilium, a dark line runs through the eye; breast creamy white, tinged with brown; abdomen buffy white.

Iris brown; bill brown; legs and feet black tinged with grey.

Distribution: Palaearctic, visits northwestern India including western Rajasthan, northern Gujarat, Saurashtra and Kutch.

Habits and habitat: An irregular visitor between August and October; infrequently met with; keeps singly; affects dry rocky, broken country supporting thorny scrub jungles; flits from tree to tree, spreading out its tail, often descending to the ground and runs and hops flicking its tail up and down, with wings drooping on its sides; food comprises exclusively insects specially grasshoppers, crickets, beetles and larvae.

Voice and calls: Generally silent, sometimes emits alarming note 'wuch-wuch'

BLUETHROAT

282. *Erithacus svecicus pallidogularis* (Zarudny)

1897. *C. (yanecula) suecica* var. *pallidogularis* Zarudny, *Mater. 1 poznaniu Fauny 1 Flory Ross. Imp.* 3:186. Type-locality: Orenburg, U.S.S.R.

Local names: Neelkān̥thi (Gujarati); Hausāini piddā (Hindi).

Recognition: A brownish ground bird much like the Indian Robin but with a conspicuous bright chestnut patch at the base of the tail, and a blue throat in male, buffish white in female; size that of the House Sparrow (length 150 mm).

Male: Upper plumage brown; wings and tail dark brown, sides of tail rufous a black band across the breast below the blue patch, followed by a chestnut band; lower breast and abdomen buffish white.

Female: Duller than the male; throat buffish white; a patch of dark spot on creamy white breast and abdomen buffish white.

Iris dark brown; bill, legs and feet horny brown.

Distribution: Palaearctic, spreads almost throughout India including the semi-arid areas of northwest India.

Habits and habitat: A winter visitor (October-April); common; keeps singly, shy, skulker; affects thick bushy ground cover, hedgerows, preferably shady places and nearabout water; mainly terrestrial, runs rapidly on ground in short steps and at each runbreak elevates and expands its tail; when alarmed freezes making itself unobtrusive and suddenly takes refuge in lower cover; roosts in reed beds and bushes growing in or along edges of water; feeds on ground; food comprises chiefly insects.

Voice and calls: Emits alarm notes 'tack tack', sometimes sings before departing in spring.

MAGPIE ROBIN 283. *Copsychus saularis saularis* (Linnaeus)

1758. *Gracula Saularis* Linnaeus, *Syst. Nat.* ed. 10. 1:109. Type-locality: Asia (= Bengal.)

Local names: Dāiyād (Gujarati); Dhāiyāl (Hindi).

Recognition: A pied robin with a long graduated tail; size that of the Bulbul (length 200 mm).

Male: Upper plumage glossy black; chin, throat and breast black; lowerparts white; wings blackish brown with a conspicuous white patch; central tail-feathers black, remainder white.

Female: Duller than male; slaty brown above, throat and breast grey; wings and tail dark brown with a white patch.

Iris brown; bill black ; legs and feet dark plumbeous to black.

Distribution: Indian subcontinent, found in greater parts of India (except eastern India and southernmost part of India including semi-arid tracts of northwestern India (central and southern Rajasthan* , northern Gujarat, and Saurashtra).

Habits and habitat: Resident with short local movements, common, keeps singly sometimes in pairs close to human habitation, groves and gardens, light forests; moves on the ground, hops about to collect morsel, often alights on tree boughs or on building parapets with tail coeked up; flight undulating; food comprises mostly insects, also earthworms, centipedes, vegetable matter and flower nectar; breeding comences in March breeding period extends upto July generally two broods raised; nest cup-shaped made of gras-rootlets, leaves, twigs, cotton-fibres, erected in tree holes, crevices in building walls, sand banks, at a height of one to four metres above ground level; clutch consists of 4-5 eggs; incubation period 12-13 days, both the sexes incubate and tend the brood.

Voice and calls: Sings marvellously in different delightful fine notations 'sweetee-sweetee-sweetee'

*Gudha Sambhar Lake, seen a pair in and around salt quarters in gardens, 1959, also a pair in Mandore, Jodhpur (A.K.M.) 1983.

BROWN ROCK CHAT
284. *Cercomala fusca* (Blyth)
 (Pl. XII, fig. 33)

1851. *Saxicola fusca* Blyth, *J. Asiat. Soc. Beng.* 20:523. Type-locality: Muttra (= Mathura, Western Uttar Pradesh.)

Local names: Kālo pāthārāl pidḍo (Gujarati); Shāmā, Dāumā (Hindi).

Recognition: A robin-like brown bird with red underparts and black tail; size between sparrow and bulbul (length 170 mm). Sexes alike.

Upper plumage rufous-brown or sooty-brown, sides of the head redder; wings and tail brown; breast and abdomen reddish.

Iris dark-brown; bill and legs black.

Distribution: Indian subcontinent confined to northern India, extending to West through eastern Rajasthan to northern Gujarat, Saurashtra and Kutch, limited to the river Narbada in the South and West Bengal in the East.

Habits and habitat: Resident; common; keeps singly or in pairs; quite confiding, boldly enters rooms and courtyards in villages and towns; affects stony wastes, crags and cliffs, rocky hills, frequents old forts, ruins and dilapidated buildings, mosques, churches and temples, specially occupies vantage position as cornice, roof-ledges, parapets; flits out from its resting place for foraging returning to the same to pass the night; when active it flexes its legs, partially spreads and cocks up its tail and bobs its forehead; a ground feeder; food comprises insects and spiders; breeds from March to August; quite pugnacious during breeding and nesting period; raises two or three broods; nest - a shallow saucer made of grass-roots, fibres, feathers, wool and hair, built in rocks, wall crevices, sometimes in open rock-bed and under rafter of a building; clutch consists of 3-4 eggs; both sexes take part in nest-building, incubation done by the female and both tend the brood.

Voice and calls: Emits an alarming note 'cheek-cheek', sometimes gives a whistle 'chee', produces a fine tune during the breeding time, also mimics voice of other birds.

STOLIOZKA'S BUSH CHAT
285. *Saxicola macrorhyncha* (Stoliczka)

1872. *Pratincola macrorhyncha* Stoliczka, *J. Asiat. Soc. Beng.* 41:239. Type-locality: Rapur, Kachh (= Kutch), Western Gujarat.

Local names: Stoliczkāpidḍo.

Recognition: A slim pied bird with a long tail and a prominent long black bill; size that of the sparrow (length 150 mm).

Male: Upper plumage sandy buff; a broad supercilium present; wings buffish brown with a white patch; rump and breast buffy white; tail dark brown, outer tail-feathers white; underparts pale buff.

Female: Similar to the male but white on the wing; outer tail-feathers brown.

Iris brown; bill black; legs; and feet blackish brown.

Distribution: Indian subcontinent, confined to northwest India including the arid and semi-arid areas of Punjab, Haryana, Rajasthan, North Gujarat, Saurashtra and Kutch.

Habits and habitat: Resident, not common; patchily distributed, keeps singly or in pairs; affects shrubby vegetation supported by sandy desert and rocky broken country; occupies tops of shrubs occasionally dropping to the ground to collect morsel; food comprises largely insects; breeds from February to June; nest-a pad of grass lined with hair and wool in holes in ground or under stone.

Voice and calls: Emits sharp notes 'chip-chip'

INDIAN COLLARED BUSHCHAT

286. *Saxicola torquata indica* (Blyth)

1847. *Pranticola indica* Blyth, *J. Asiat. Soc. Beng.* 16:129. Type-locality: India (= Calcutta.)

Local names: Mendio piddo (Gujarati); Khar piddā (Hindi).

Recognition: A small chat, male recognizable by its collared and reddish breast; female dull brown with a less marked rump-patch and traces of white shoulder patch; size that of the munia (length 130 mm). Sexes dissimilar.

Male: Upper plumage brownish black; a conspicuous white patch on wings and base of the tail; throat black; breast orange-rufous; rest of the underparts pale rufous.

Female: Upper plumage brown; white patch on wings inconspicuous; rufous patch at the base of tail duller; underparts pale orange-rufous.

Iris dark-brown; bill legs and feet black.

Distribution: Palearctic, widely distributed in India including northwest Indian plains in winter.

Habits and habitat: Migratory; winters from September to April; keeps singly; affects open bushy country, cultivation; restless, constantly flicks its wing and tail; perches on tops of standing crop or bush and makes sorties in search of insects; flight fast and strong; food comprises insects, largely ants, beetles, hoppers and caterpillars.

Voice and calls: Emits alarm notes 'chat-chat'

PIED BUSH CHAT

287. *Saxicola caprata bicolor* Sykes

1832. *Saxicola bicolor* Sykes, *Proc. zool. Soc. Lond.* 92. Type-locality: Dukhun (= Deccan, South India.)

Local names: Shuāmā piddo (Gujarati); Kālā piddā (Hindi).

Recognition: A pied little bird with white wings and rump patches (male); female dark brown with a rusty rump; size that of the munia (Length 130 mm).

Male: Upper plumage deep black; a conspicuous white wing patch; a large white patch at the base of tail; chin, throat and breast black; abdomen and under tail-coverts white.

Female ; Upper plumage greyish brown; wings brown with buff edge; patch above tail rusty brown; wings and tail blackish brown; underparts fulvous with a rusty tinge.

Iris dark-brown; bill, legs and feet black.

Distribution: Palaearctic, spreads over northwestern India including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan, southwest to northern Gujarat, Saurashtra and Kutch and south to Karantaka and east to West Bengal.

Habits and habitat: Largely a winter visitor; common; keeps singly; affects plains and lower hills, open grassland and light scrubby forest, hedges, cultivated crop and gardens; from perches of tops of tall bushes, grass clumps, it files to the ground to collect morsel, hunting insects and returns to its perch with its prey, and twitches its tail, also makes sorties to collect winged-insects; food comprises, small insects-ants, beetles hoppers, caterpillars and grubs.

Voice and calls: A harsh chippy sound 'tick-tick', also emits a plaintive whistle 'pee-pee', 'teetoo-too'

ISABELLINE CHAT

288. *Oenanthe isabellina* (Temminck)

1829. *Saxicola isabellina* Temminck, *Pl. col.* (79), pl. 472, fig. 1. Type-locality: Nubia, Africa.

Local names: Pilo piddo (Gujarati).

Recognition: A sandy brown bird with upright posture; legs long; a conspicuous black and white tail; size between sparrow and bulbul (Length 160 mm). Sexes alike.

Upper plumage sandy to isabelline; underwing-coverts white; a pale white streak behind eye; lores and streak through eye black; throat almost white; underparts pale buff-white; upper tail-coverts and base to half of tail white and rest black.

Iris dark-brown; bills, legs and feet black.

Distribution: Palaearctic, visitor to northwestern and northern India plains including the arid and semi-arid areas of Punjab, Haryana, Rajasthan, and Gujarat.

Habits and habitat: Winter visitor (October-March); rather uncommon; quite solitary; affects open, rocky and sandy country, studded with scrubs and bushes, perches on stony ground and on bush tops, mostly terrestrial and a good runner; forages on ground moving swiftly about, hopping and dipping up and down, food comprises mainly insects, occasionally weed-seeds.

Voice and calls: Emits a low sweet tune.

REDDTAILED CHAT

289. *Oenanthe xanthopyrma kingi* (Hume)

1871. *Saxicola kingi* Hume, *Ibis*: 29. Type-locality: Jodhpur, West Rajasthan.

Local names: Lāl pūnchh pidlo (Gujarati).

Recognition: A grey-brown chat with a rufous rump at base of tail; size between sparrow and bulbul; (length 160 mm). Sexes alike.

Upper plumage pale grey-brown; supercilium dull greyish white; rump rufous; upper tail-coverts and tail dull rufous; central tail feathers black, tips of tail banded black; underparts greyish with light pink wash.

Iris brown; bill black; legs and feet dark-brown to black.

Distribution: Palaerctic, winters in northwestern India including the arid areas of Rajasthan and Gujarat.

Habits and habitat: Winters from October to March; keeps singly; uncommon; affects boushy, sandy and rocky country; perches on rocks or bush tops; more terrestrial than the Isabelline Chat runs swiftly on ground and hides under low bushes or in rodent holes; food comprises exclusively insects.

Voice and calls: Emits a startling note 'thrr-thrrr-thrrr'

CENTRAL ASIAN DESERT WHEATEAR

290. *Oenanthe deserti deserti* (Temminck) (Pl. XII, fig. 34)

1825. *Saxicola deserti* Temminck, *Pl. col.* (60), pl. 359, fig. 2. Type-locality: Egypt.

Local names: Rānn pidlo (Gujarati).

Recognition: A sand-coloured chat with a black or brown throat-patch and a white or buff patch at the base of the tail; size that of the House Sparrow (length 150 mm). Sexes dissimilar.

Male: Crown grey; a distinct white supercilium; sides of head, neck, chin and throat black; mantle sandy brown; wings black, feathers edged with white, a white patch on wing conspicuous in flight; rump, base and basal half of tail white, rest of the tail black; lower parts buff, brighter on breast.

Female: Like the male but duller and black replaced by light brown; undersurface of tail white.

Iris brown; bill, legs and feet black.

Distribution: Palaearctic; visits northwestern, northern and central India, including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan and Gujarat.

Habits and habitat: Winters from mid September to March end; solitary, fairly common; affects broken, sandy and desert country studded with scrubby bushes; perches on the top of short bushes or on rocks; terrestrial, forages actively in short fast runs hunting insects, sometimes captures winged-insects in air; food comprises exclusively insects beetles, hoppers and crickets.

Voice and calls: Emits alarm notes 'chit-tt-tt'

PIED CHAT

291. *Oenanthe picata* (Blyth)
(Pl. XI, Fig. 32)

1847. *Saxicola picata* Blyth, *J. Asiat. Soc. Bengal.* 16:131. Type-locality: Scinde (= Sind), Pakistan.

Local names: Kābāro pidḍo (Gujarati).

Recognition: A black and white chat-like bird with a conspicuous black band on tail (male), female brown; size between sparrow and bulbul (length 170 mm).

Male: Head, mantle, wings, chin, throat and upper breast black; rump, upper tail-coverts and underparts white; central tail-feathers black, rest white with terminal black band.

Female: Black, upper plumage in male replaced by brown; chin throat and upper breast dark brown; rest of the underparts pale buffish white.

The species has three phases, viz. (i) The white-bellied (ii) white-crowned and (iii) black-bellied, the last being most common.

Iris brown to dark-brown; bill, legs and feet black.

Distribution: Palaearctic, winters in northwest India including the arid parts of Punjab, Haryana and Gujarat, also moves as far as Delhi in the East, central parts of Madhya Pradesh and northern Maharashtra.

Habits and habitat: An early visitor, winters from August to March; keeps solitary; perches on mud walls, under roof of huts, shaded cornice, rock-crevices, projections under shades of trees, to pass off mid-day heat; affects open desert, broken rocky and sandy terrain supporting scrub jungles; strong and fast flier, flies low above ground; from perch hunts insects on ground as well as makes sorties to capture insects on wings; food comprises largely terrestrial insects, also winged termites, ants and flies; pugnacious, territorial, each bird strongly guards its foraging territory against intruders.

Voice and calls: Emits sweet tunes almost like the Magpie-Robin also mimics notes of other birds as warblers, swallows, shrikes and other chats.

BROWNBACKED INDIAN ROBIN
292. Saxicoloides fulicata cambaiensis (Latham)

1790. *Sylvia cambaiensis* Latham, *Index Orn.* 2:554. Type-locality: Guzerat (= Gujarat.) Western India.

Local names: Deoli, Kālā devā (Gujarati); Kālchuri (Hindi).

Recognition: A black or dark-brown bird with a white shoulder-patch in male; female ashy brown without the shoulder patch; tail cocked, sometimes held high up and bent on back when excited; slightly larger than the House Sparrow (length 160 mm).

Male: Head, mantle and wings dark-brown; a white patch on wings conspicuous; tail black; underparts glossy black with a blue sheen; under tail-coverts chestnut.

Female: Head, mantle and wings dark-brown; ear-coverts paler; underparts greyish brown with centre of abdomen and under tail-coverts deep chestnut.

Iris dark-brown; bill, legs and feet black.

Distribution: Indian subcontinent, spreads over northwestern and northern India as far East as Bihar and limited to the river Tapi in South.

Habits and habitat: Resident; keeps solitary, sometimes in pairs; affects open scrub jungle in dry plains and hilly country; also in and near about villages, cattle ranch, confident enough to enter house and to rest on roofs of houses and in courtyards with least suspicion; hops and runs about in short steps for foraging, excitement indicated by up and down movement of tail; food comprises miscellaneous insects, largely termites and ants; breeds from March to August; nests in holes in buildings, embankments, rock crevices, trees; nest-pad of grass lined with roots and fibres, wool, feathers, hair; clutch consists of 2-4 eggs; both sexes build the nest and tend the young; female only incubates, incubation period 11-12 days.

Voice and calls: A low musical tune like the Magpie-Robin, at times the male emits 'seetch-seetch' repeated several times.

INDIAN BLUE ROCK THRUSH
293. Monticola solitarius pandoo (Sykes)

1832. *Petrocincla Pandoo* Sykes, *Proc. zool. Soc. Lond.* 87. Type-locality: Ghauts, Dukhun (= Western Ghats, Deccan.)

Local names: Pāndu shyāmā (Gujarati); Nilā sāmā (Hindi).

Recognition: A dark bluish solitary bird with a short tail and long legs, much like the Brown Rock Chat; size between bulbul and myna (length 230 mm).

Male: Upper plumage darkish blue, more dark on the lores and throat, feathers fringed with fulvous; underparts dull dark-blue, feathers barred with blackish and fringed with brown on breast and white on abdomen; wings and tail dark-brown with a tuft of dark-blue; wing feathers tipped with buff.

Female: bluish but much duller than the male with ashy brown tint; a pale wing-bar noticeable in flight; chin and throat creamy buff, feathers tinged with black; underparts creamy buff barred with black.

Iris brown; bill dark-brown to black; legs and feet black.

Distribution: Palaearctic, winters in the plains of India including the arid tracts of Haryana, Punjab, Rajasthan and Gujarat.

Habits and habitat: Winters from September to March; not uncommon; keeps singly; confiding in winter quarters; often crouches and bobs up and down; affects rocky, boulderous country, also coastal areas; rests on parapets, cornice of old forts and buildings, walls of ruins, stone quarries and brick kilns; forages on ground; food comprises largely terrestrial insects, also snails and centipedes; pugnacious, sticks to a particular area and strongly attached to a particular place.

Voice and calls: Not heard in winter quarters.

INDIAN GREY TIT

294. *Parus major stupae* Koelz

1939. *Parus major stupae* Koelz, *Proc. biol. Soc. Wash.* 52:61. Type-locality: Sanchi, Bhopal, Madhya Pradesh.

Local names: Ramachakli (Gujarati).

Recognition: A bluish grey tit with a black head and neck and a white cheek-patch; size that of the munia (length 130 mm). Sexes alike.

Upperparts bluish grey to ashy grey; head and neck black; a white patch on cheek and a faint white patch on nape conspicuous; wing dark-brown with a white bar across; tail blackish; outer tail-feathers white; chin, throat and breast and a broad line up to the centre of abdomen glossy black; rest of the underparts white.

Distribution: Indian subcontinent, found in Rajasthan and Gujarat, central and South India except Kerala.

Habits and habitat: Resident, fairly common, keeps in pairs or in loose parties; affects light forested areas, groves and gardens; flits from tree to tree and branch to branch for foraging purpose; pulls out insects from under bark or collects among tree leaves; food comprises small insects and larvae; breeds from June to August; generally raises two broods; nests in hollows of trees or some cavities in mud walls or rock crevices; nest-saucer-shaped composed of grass, fibres, leaves, rootlets, soft hair, down feathers and moss; clutch consists of 4-6 eggs; both sexes take part in nest-building, incubating and tending the young.

Voice and calls: Generally emits notes 'tsee-tsee-tsee', also produces whistling notes 'weeter-weeter-weeter-chee-chee'

WHITEWINGED BLACK TIT

295. *Parus nuchalis* Jerdon

1844. *Parus nuchalis* Jerdon, Madras J. Lit. Sci. 13:131. Type-locality: Eastern Ghauts (= Eastern Ghats, Peninsular India.)

Local names: Kābāri rāmchākli (Gujarati).

Recognition: A pied tit, overall black with white band on wings and white outer tail-feathers; size that of the munia (length 130 mm). Sexes alike.

Upper plumage glossy black, nape bears a white patch, wings black with a conspicuous white pattern; cheeks, sides of neck white; underparts white with a broad black band running from chin to vent; tail black, outer rectrices white.

Iris dark-brown; bill black; legs and feet dark-grey.

Distribution: Indian subcontinent, discontinuously distributed in northwest India and South India. The northwestern populations patchily distributed, spread over West*, Central and South Rajasthan, northern Gujarat and Kutch.

Habits and habitat: Resident, infrequently met with; keeps in pairs; affects light forested areas, babul (*Acacia* spp.) thickets, scrubs, hedgerows; food comprises exclusively insects; breeds from May to August; nests in holes and hollows in trees or mud walls; nest-a pad of fibrous material, wool, fur, cotton thread, hair, etc.

Voice and calls: Emits a musical note 'si-weesi-wee-wee', repeated from time to time.

RAJASTHAN SPOTTED GREY TREE CREEPER 296. *Salpornis spilonotus rajputanae* R & A Meinertzhagen

1926. *Salpornis spilonotus rajputanae* R & A Meinertzhagen, Bull. Br. orn. Cl. 46:83. Type-locality: Sambhar, Jaipur District, Central Rajasthan.

Local names: Rakhodi thad-chad (Gujarati).

Recognition: An arboreal little brown bird with a slender, long curved bill and a short stiff tail like the woodpecker; size that of the munia (length 130 mm). Sexes alike.

Upper plumage cinnamon brown, spotted with white; a conspicuous white supercilium and a black eye-stripe; ear-coverts dark; tail white barred with brown.

Chin and throat white, breast and abdomen fulvous barred with dark-brown; legs and feet black.

*Observed a pair in Jaisalmer, West Rajasthan in the inner court of a building, regularly visiting a stunted tree in January 1983 (A.K.M.)

Distribution: Indian subcontinent, confined to central and southeastern Rajasthan.

Habits and habitat: Resident; rather uncommon; found singly; affects old thorny trees; moves forward and backward while scanning barks of trunks and branches, much like the movement of nuthatches and woodpeckers; climbs from bottom of trees and ascends in spirals; food comprises largely insects, also spiders; breeds from March to May; attaches a deep cup-shaped nest made of dry fragmented leaves, twigs, bark-bits wrapped with cobwebs to branch forks, about 3-5 metres above ground; clutch consists of 2-3 eggs; both sexes incubate and tend the young.

Voice and calls: Produces more or less the tune of a sunbird 'chichichiu-chi-chi-chiu'

NORTHWESTERN PADDYFIELD PIPIT 297. *Anthus novaeseelandiae waitei* Whistler

1936. *Anthus rufulus waitei* Whistler, *J. Bombay nat. Hist. Soc.* 38:766. Type-locality: Jhelum Punjab, Pakistan.

Local names: Dhān chidi (Gujarati); Rugāil, Chārāchāri (Hindi)/

Recognition: A small brown bird with breast streaked and a long, straight, slender hind claw; activities more or less confined to the ground; size that of the sparrow (length 150 mm). Sexes alike.

Upper plumage fulvous brown with dark streaks; wing dark-brown; tail dark-brown, outermost feathers white; a fulvous streaked distinct supercilium; breast with dark-brown.

Iris brown; bill horny brown paler at the base, lower mandible yellowish with smoky on tip; legs and feet flesh-coloured with yellowish tinge.

Distribution: Indian subcontinent, confined to northern and western India limited to Gangetic riverine plains in the North and river Narbada in the South.

Habits and habitat: Resident; common; keeps in pairs or loose parties; affects open country, grassland and harvested cropland, sandy tracts; keeps to the ground, running about to collect morsel; flight undulating, rises in air in successions and lands at a short distance on the ground to resume its activities; roosts in bushes; food comprises largely insects-small beetles, bugs, ants, termites, also spiders, weed seeds, grass bits; breeds from April to July; nests in concealed places-grass tufts, approachable through a tunnel; nest cup-shaped made of grass, grassroots, hair; clutch consists of 3-4 eggs; both sexes build the nest, incubate and tend the brood.

Voice and calls: Emits feeble 'tseep-tseep' notes specially when it takes to wings.

TAWNY PIPIT 298. *Anthus campestris campestris* (Linnaeus)

1758. *Alauda campestris* Linnaeus, *Syst. Nat.* ed. 10, 1:166. Type-locality: Europe(= Sweden).

Local names: Dhān chidi (Gujarati); Chillu (Hindi).

Recognition: A sand-coloured, lightly streaked small bird, unspotted below, slightly larger than the House Sparrow (length 160 mm). Sexes alike.

Upperparts pale brown; edges of wing-coverts sandy buff; supercilium cream white; eye-streaks black.

Underparts buff to pale white with a primrose yellow wash; spots on the breast absent in adult but subadult bears dark streaks on breast.

Iris dark-brown; bill dark-brown above, pinkish fleshy below; legs and feet yellow.

Distribution: Palaearctic, winters over much of India except the northeastern and southwernmost parts.

Habits and habitat: Winter visitor (September to mid-April); common; keeps singly or in small scattered parties; affects scrubby, sandy and stony country, fallowland, harvested cultivated land, pastures; forages on ground; food comprises small insects and weed seeds.

Voice and calls: Wintering birds not heard calling.

PERSIAN ROCK PIPIT

299. *Anthus similis decaptus* Meinertzhagen

1920. *Anthus sordidus decaptus* Meinertzhagen, *Bull. Br. orn. Cl.* 41:23. Type-locality: Rud -i-Taman, East Iran.

Local names: Pāthrāl Dhān chidi (Gujarati).

Recognition: A long-tailed pale brown pipit with a distinct but short supercilium and a short hind claw; size that of the Bulbul (length 200 mm). Sexes alike.

Upperparts uniform rufous brown; head and back finely streaked; wings darker; tail dark brown, tail-feathers edged white. Throat whitish; breast buff with pale brown streaks; rest of the underparts pinkish buff.

Iris dark-brown; bill dark-brown; legs and feet flesh-coloured.

Distribution: Palaearctic, winters in northwest India including Punjab, Haryana, semi-desert part of Rajasthan, northern Gujarat and Saurashtra.

Habits and habitat: Winter visitor (October to March); found singly or in pairs; moves with head erect; affects sandy, scrubby and rocky country, also dry cultivated fields and grassland; takes cover in tufts of grass or in thick shrubs; steps quickly for foraging among thorny thickets and bushes, sometimes flushes to take a short low, undulating flight; food comprises small insects and berries.

Voice and calls: Emits a single note 'chirrup' or 'chip', repeated at short intervals.

ALPINE PIPIT

300. *Anthus spinoletta coutellii* Audouin

1828. *Anthus Coutellii* Audouin, in Savigny, *Deser. Egypte. Ois.* 23, pl. 5:360. Type-locality: Egypte (= Egypt.)

Local names: Jāl chillu (Hindi).

Recognition: A brown faintly streaked pipit with a white eye-stripe and dark legs; size that of the House Sparrow (length 150 mm). Sexes alike.

Upper plumage fulvous brown; crown and mantle lightly streaked; wings brown with double wing-bars; tail blackish brown, outer tail-feathers white; breast light brown, streaked; abdomen whitish.

Iris brown; bill dark-brown; legs and feet black.

Distribution: Palaearctic, winters in wetter parts of western Uttar Pradesh, northwestern parts of Madhya Pradesh, Punjab, Haryana, eastern Rajasthan, as far west as Jodhpur and the valleys of the Aravallis.

Habits and habitat: Winters from October to March; common, keeps singly or in small loose flocks; affects marshes, edges of irrigation canal, tanks, ponds and well-watered cultivated fields; forages on ground with other pipits and wagtails; food comprises small insects.

Voice and calls: Emits a single note 'see', sometimes also produces double note 'tsi-tsi' on wings.

GREYHEADED YELLOW WAGTAIL

301. *Motacilla flava thunbergi* Billberg

1928. (*Motacilia*) *Thunbergi* Billberg, *Synops. Faun. Scand.* 1(2):506. Type-locality: Lapland.

Local names: Mātāno pilakyo (Gujarati); Pilkyā (Hindi).

Recognition: A small long-tailed, greenish yellow bird with a grey head and olive back; size between sparrow and bulbul (length 170 mm). Sexes alike.

Head, nape, ear -coverts bluish grey; supercilium white but obscure; upper plumage olive-green; wings dark-brown with two yellowish bars and marginated with fulvous; tail black, two outer tail-feathers white; underparts bright yellow.

Iris brown; bill, legs and feet horny brown.

Distribution: Palaearctic, visits throughout the Indian plains including the arid and semi-arid tracts of northwest India.

Habits and habitat: Winters in September to April; common; keeps in small flocks but aggregates in hundreds of thousands on migratory movements; keeps to moist ground, near water-edges of tanks, ponds, canals or pools, also irrigated fields; moves in short spurts, quickly

runs to collect morsel stopping for a short while wagging its tail up and down; flight undulating; roosts in reed beds or in standing millets; food comprises small insects-bugs, beetles and dipterous flies, also spiders.

Voice and calls: While taking off emits high pitched double note 'weesp-weesp'

BLACKBACKED YELLOWWAGTAIL
302. *Motacilla citreola calcarata* Hodgson

1836. *Motacilla (Budytes) Calcarata* Hodgson, *Asiat. Res.* 19:190. Type-locality: Nepal.

Local names: Pilā Māthāno Pilakiyo (Gujarati); Pilkyā, Pāni-ki-pilkyā (Hindi).

Recognition: A yellowheaded, black-backed wagtail; size between sparrow and bulbul (length 170 mm). Sexes dissimilar.

Male: Head lemon -yellow; supercilium yellow; mantle black in winter or dark grey; rump black; wings and tail dark brown with outer edges of feathers white; underparts yellow.

Female: Yellow of the head paler or dark grey; underparts light yellow to whitish.

Iris dark-brown; bill black; legs and feet black to dark grey.

Distribution: Palaearctic, visits northern India plains, as far South as Madhya Pradesh, East to Assam.

Habits and habitat: Winter visitor; common; gregarious; keeps in loose parties and scattered pairs; aggregates in large parties of several hundreds on migratory movements; affects marshes, tanks, pools, ponds; runs about on water edges with quick steps covering a short distance and stops to wag its tail up and down, also trips on floating leaves; flight undulating; roosts in bushes near water, also in standing crop of millets; food comprises largely aquatic insects, midges, also tiny molluscs.

Voice and calls: Emits call-note 'cheese-chit'

GREY WAGTAIL
303. *Motacilla cinerea cinerea* Tunstall

1771. *Motacilla Cinerea* Tunstall, *Orn. Brit.* 2. Type-locality: Wycliffe, Yorkshire, England.

Local names: Vānā Pilākiyo (Gujarati); Bhūrā pilkyā (Hindi); Bālkātāra (Punjabi).

Recognition: A bluish grey wagtail with a long slender black tail and yellow underparts; size that of the House Sparrow (length 170 mm + the tail). Sexes similar in winter.

Upper plumage bluish grey with a green sheen; a dull whitish supercilium; cheeks grey; wings dark-brown with white margins; upper tail-coverts and rump greenish yellow; tail black, outer three parts white; chin and throat white; abdomen yellow; under tail-coverts sulphur yellow.

Iris brown; bill horny grey; legs and feet fleshy brown.

Distribution: Palaearctic, widely distributed in the plains and hills of India, including the arid and semi-arid tracts of north-west India.

Habits and habitat: Winter visitor (September to March); infrequently met with; found singly sometimes in pairs; affects margins of water, running about the edges of canals, shallow streams (Gir forest), reservoirs; steps fast on ground and as it stops constantly wags its tail up and down, turns, twists and springs up in air to capture insects on wings; flight low and undulating; roosts in reed beds, tamarisk, also in trees and roof tops; food comprises insects, occasionally tiny molluscs.

Voice and calls: Emits a shrill note 'tzit-zee' while taking off from ground.

INDIAN WHITE WAGTAIL 304. *Motacilla alba dukhunensis* Sykes

1832. *Motacilla Dukhunensis* Sykes, *Proc. zool. Soc. Lond.* 91. Type-locality: Dukhun (= Deccan), South India.

Local names: Khātriāni (Gujarati); Dhobān (Hindi); Bālkātārā (Punjabi).

Recognition: A small bird of black and white, and grey plumage, and a long tail, incessantly wagging its tail up and down; size that of the bulbul (length 180 mm). Sexes alike in wintering birds.

Forehead and earcoverts white, back of the head and nape bear black patch; upper plumage ashy grey; wings black, feathers margined grey and white; tail blackish brown, the two outer pairs white.

Iris dark-brown, bill and legs black.

Distribution: Palaearctic, widely spread throughout the greater parts of India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: A winter visitor (September to April); common; keeps singly or in loose flocks; affects damp places in the proximity of water, occasionally perches in trees or in roofs of huts; forages in ground among grass and cultivation, watercourses, garden lawns, moving fast with quick steps, mostly running after its prey; foraging competition among party members pronounced; food comprises mostly insects, sometimes small molluscs and grain; flight jerky and undulating with rapid undulating movement; community roosting-roosts in reed beds.

Voice and calls: Emits call notes 'chiz-bit' while takes to flight, also sings a short melodious songs.

LARGE PIED WAGTAIL 305. *Motacilla maderaspatensis* Gmelin

1789. (*Motacilla*) *maderaspatensis* Gmelin, *Sys. Nat.* ed. 13, 1:961. Type-locality: Madras.

Local names: Khānjān (Gujarati); Māmūlā, Bhuin māmula, Khānjān (Hindi).

Recognition: A large black-masked pied wagtail, more or less like the Magpie-Robin, distinguishable from all other wagtails by the presence of a conspicuous supercilium extending to the nape; size that of the bulbul (length 210 mm). Sexes alike, female sometimes duller.

Upper plumage black; wings black, quills finely edged with white; tail black, two outer tail-feathers largely white; throat and breast black; abdomen and under tail-feathers white; flanks light grey.

Iris dark-brown; bill, legs and feet black.

Distribution: Indian subcontinent, widely distributed throughout India including the arid and semi-arid tracts of northwest India.

Habits and habitat: Resident; found singly or in small parties; keeps to ground in the open or light forested areas in the proximity of water; affects margins of ponds, tanks, reservoirs, running streams or rivulets; forages on edges tripping along the water course, wagging its long tail; food comprises largely insects as small beetles, grasshoppers, locusts, gryllids, dragonflies, also snails and wild seeds; flight peculiarly undulating-jerky with incessant rise and fall in air; perches on rocks, elevated ground, bunds, tops of village huts and embankments; breeds from March to June; nests in holes in bank walls, fissures in old buildings, crevices and under slabs of rocks also under culverts and bridges; nests made of grassroots and blades shaped into a shallow cup lined with rootlets, hair, wool, fibres, cotton, etc.; clutch consists of 3-5 eggs; both sexes build the nest, incubate and tend the brood.

Voice and calls: Song somewhat like the Magpie-Robin. Utters an alarm call 'zit-chit' when takes off to air.

SIND PURPLE SUNBIRD

306. *Nectarinia asiatica brevirostris* Blanford

1873. *Nectarinia (Arachnechthra) brevirostris* Blanford, *Ibis*, 3:86. Type-locality: (Persian) Baluchistan near Jask (Iran).

Local names: Phūl chākli (Gujarati), Phūl soongni (Hindi); Kālā piddā (Punjabi).

Recognition: A tiny metallic dark blue and purple or olive-brown little bird with a long curved bill; slightly smaller than the munia (length 100 mm).

Male: Upper plumage, throat and breast metallic purple with blue-green sheen; wing-feathers brownish black; tail black with a bluish tinge; a coppery brown narrow band across the breast; abdomen dull purplish black; a tuft of bright yellow and scarlet feathers under each wing.

Female: Upper plumage olive-brown; tail brown, outer feathers tipped with white; underparts bright yellow.

Iris dark brown; bill, legs and feet brownish black.

Distribution: Indian subcontinent, found throughout north-western India including the arid and semi-arid tracts of Punjab, Rajasthan, north Gujarat and Kutch.

Habits and habitat: Resident and partially migratory; not uncommon; keeps singly or in pairs; affects *Calotropis* plants and wild caper in arid areas, hedges, groves and gardens; flits about flowers and perches on twigs or stems of plants; food comprises nectar of flowers, blossoms, small arboreal insects on wings, specially midges, moths and butterflies, bees also larvae and spiders; breeds from March to June; nuptial display includes rapid vibration of wings and hovering of the male to attract attention of the female, then suddenly disappearing from the scene and reappearing to repeat the act; nest-oval or pear-shaped with a small round or oval lateral entrance, made of long fine grass, dry leaves, fragments of bark, soft waste paper strips and bits, rags, wool and hair, plastered well with cobwebs outside and lined with soft seed down; generally raises two broods; birds suspend the nest from a twig or thorn of shrub, sometimes from a leaf or hedge-twigs, about a metre from the ground; clutch consists of 2-3 eggs; female builds the nest and incubates; incubation period 14-15 days; both sexes tend the brood.

Voice and calls: Emits shrill chirping note 'chip', followed by a loud 'chweet' and a shrill song by male perched on twig or telegraphic wire.

INDIAN HOUSE SPARROW

307. *Passer domesticus indicus* Jardine & Selby

1835. *Passer indicus* Jardine & Selby, *Ill. Orn.* 3, pl. 118. Type-locality: Bangalore, Karnataka, South India.

Local names: Chākli (Gujarati), Gouriya (Hindi).

Recognition: A small greyish brown and rufous chestnut bird with a dark grey crown, white cheeks, black throat and a white shoulder patch in male; female duller, lacks a black throat; smaller than the bulbul (length 150 mm).

Male: Crown ashy grey; a broad line above eye chestnut-black; nape and upper back chestnut; rump ashy grey; wings rufous and dark brown with two pale white bars; tail dark brown; chin to upper breast black, remaining underparts white; flanks ashy grey.

Female: Upper plumage greyish brown streaked with dark brown on the upper back; wings dark rufous-brown and with two wing-bars white; underparts ashy white.

Iris brown; **bill** dark brown (male), light brown (female); **legs and feet** fleshy brown.

Distribution: Indian subcontinent, found throughout India including the arid tracts of northwestern India.

Habits and habitat: Resident, very common, population regulated by food supply commensal with man; affects cultivated and harvested fields, grain stores in rural areas and shops, kitchen, gardens and residential houses; food comprises weed-seeds grain, flower buds, petals and seeds, tender shoots, cooked food, kitchen scraps also collects insects, larvae, spiders, etc., to feed the nestlings; roosts in trees, huts and buildings; breeding period March to June; rears several successive broods; nest-a shallow cup made of straw, grass or jute fibres, cotton

strings lined with feathers; erects nest in any support to base the nest, in ventilators, racks, holes and hollows in walls, crevices in old buildings and ruins, such sites that are not directly approachable by predators to the nests; clutch consists of 3-4 eggs; female incubates; incubation period 14 days; both the sexes build the nest and tend the brood.

Voice and calls: Chirrup noisily, male utters 'chirp-chirp-chirp' incessantly.

KASHMIR HOUSE SPARROW 308. *Passer domesticus perkini* Whistler

1920. *Passer domesticus parkini* Whistler, *Bull. Br. orn. Cl.* 41:13. Type-locality: Srinagar, Kashmir.

Local names: Pāhāri Gauriyā, (Hindi).

Recognition: More or less like the House Sparrow but larger, and darker and with a larger bill; size between House Sparrow and Bulbul (length 160 mm).

Male: Chestnut deeper, black streak more pronounced in general; breast has more extensive black.

Female: Darker, more smoky below.

Iris greyish brown; bill pale brown above with a darker tip above, fleshy with a dusky tip (Below); legs and feet pale brown.

Distribution: Palaearctic, found in the plains of Rajasthan in winter.

Habits and habitat: Winters from October to March; keeps in flocks; affects rural human settlement; forages among standing crop, causing considerable loss to crop yield; food comprises cereals, wild grass and weed seeds; roosts in thorn thickets in large congregation.

Voice and calls: Similar to that of the House Sparrow.

SPANISH SPARROW 309. *Passer hispaniolensis transcaspicus* Tschusi

1902. *Passer hispaniolensis transcaspicus* Tschusi, *Orn. Mber.* 10:96. Type-locality: Transcaucasia = Iolotan, Transcaspia, U.S.S.R.

Local names: Pācchimi Churi (Hindi).

Recognition: Much like the House Sparrow; male have throat black and flanks streaked, the female resembles the female of the House Sparrow; size that of the House Sparrow (length 150 mm).

Male: Head chestnut; mantle black streaked with white; wings pale brown; throat and breast black; cheeks white; abdomen and under tail-coverts whitish streaked with brown; flanks streaked with dark brown.

Female: Distinguishable from the House Sparrow in having faintly streaked breast.

Iris dark brown; bill horny brown above, yellowish below; legs and feet horny brown.

Distribution: Palaearctic, migrates to northwest India including Punjab, Haryana, northeast and Rajasthan (except arid tracts).

Habits and habitat: Winter visitor, very common; gregarious; moves in large flocks; affects cultivated crop fields and semi-desert scrubby country; forages throughout the day among standing crop in mixed parties of House Sparrow; food comprises cultivated grain and seeds, also insects; roosts in large congregations in reeds and tall bushes.

Voice and calls: Chirrup like the House Sparrow.

YELLOWTHROATED SPARROW

310. *Petronia xanthocollis transfuga* (Hartert)

1904. *Gymnorhis flavicollis transfuga* Hartert, *Vog. pal. Fauna* 1:145. Type-locality: Bagu Kelat, Baluchistan.

Local names: Pāhelwān Chākli (Gujarati); Rāji, Jāngli chiria (Hindi).

Recognition: A sparrow-like bird with a chestnut patch on wings and a bright yellow patch on throat; size between House Sparrow and Munia (length 140 mm). Sexes apparently alike.

Upper plumage ashy brown, wings brown and bear two wing-bars, upper whitish with a chestnut patch above the bar, lower buffish; tail brown; throat dull yellowish white with a conspicuous yellow patch; remaining underparts whitish.

Female differs from male in bearing a dull yellow throat-patch and rufous brown wing-patch replacing the chestnut patch.

Iris brown; bill black (breeding male), brown (non-breeding male and female); legs and feet greyish brown.

Distribution: Indian subcontinent, northwest India including Punjab, Haryana, Rajasthan, Gujarat and Kutch.

Habits and habitat: Resident, not uncommon; keeps in small loose parties, gregarious in non-breeding season; shy and warier than other sparrows; takes shelter in trees when disturbed; keeps in mixed flocks with other sparrows and buntings while foraging and roosting; affects thorny forests and gardens supported on barren and cultivated plains and in lower hilly country; roosts in thickets of tall grass, scrubby and shrubby thickets; spends the day hours among thick leafy trees; feeds on nectar and pollen of flowers, standing crop as well as grains

*Seen in pairs in Pokhran, western part of Jodhpur district (A.K.M. 1959, October).

from stubbles, grass and weed-seeds also insects and spiders' ; breeds from February to August, often raises two broods; nests in holes and hollows of trees, hollows of standing disused pipes and poles, about 5-7 metres above the ground; nest-a pad of dry grass, lined with feathers and wool; nest-building and incubation done by the female only; both sexes tend the brood.

Voice and calls: That of the House Sparrow, at times emits pleasant notes 'chilp-chilp' for a long period.

INDIAN BAYA

311. *Ploceus philippinus philippinus* (Linnaeus)

1766. *Loxia Philippina* Linnaeus, *Syst. Nat.*, ed. 12, 1:305. Type-locality: Philippines errore (= Ceylon = Sri Lanka).

Local names: Sughāri (Gujarati); Bāyā, Sōn-chiri (Hindi).

Recognition: A sparrow-like bird with a heavy conical bill; fulvous, closely streaked with blackish brown above; breeding male attains yellow on head and breast; non-breeding male and female yellowish buff, streaked with dark brown above, fulvous below; body pose much more upright than the sparrow; size that of the House Sparrow (length 150 mm); Sexes dissimilar in breeding season otherwise almost alike.

Male (breeding); Crown and breast bright yellow; forehead, lores, ear-coverts, chin and throat blackish brown, upper plumage brownish black, feathers edged with yellow; rump fulvous; wings and tail dark brown, edged with fulvous.

Female and male (in winter): Crown and back fulvous, streaked with blackish brown; supercilium and sides of head and neck yellowish buff; underparts fulvous to off-white streaked with brown.

Iris brown; bill horny brown (breeding male-dark horny brown); legs and feet flesh-coloured.

Distribution: Indian subcontinent, found practically all over India except eastern and northeastern India and southwestern coastal belt (not found in absolute dry arid sandy deserts of Rajasthan and scarce in the arid parts of northern Gujarat, Kutch and Saurashtra in winter).

Habits and habitat: Resident, common (from spring to autumn); affects open cultivation, grassland and arable country in well watered areas; gregarious; flocks move from one crop field to another consuming cereals to an appreciable quantity and during off cultivation period much depends on wild grass seeds; food comprises seeds of wild grass, millets (Jowar, Bazri), cereals (paddy and wheat); nectar of flowers and for nest lings collects insects and spiders; congregates to roost in reed-beds, standing crop, also tall grass-clusters with other sparrows and munias; breeds from July to October; at times raises two broods; colonial nesting; nest-long, retort-shaped with a funnel-shaped entrance, made of closely woven grass strips, waterproof and wind

*Spiders obtained from two specimens (*Petronia x. xanthocollis*) collected from southern Goa, (A.K.M. 1973).

resistant; nest suspended from slender branches of thorny trees as babul (*Acacia* spp.), Khejra (*Prosopis* spp) or Gular (*Ficus* spp.) tasseled from branches; nest site generally over water; nest material consists of long strips of millet or paddy; adult males do all construction and before completion of the egg-chamber inspection and approval of the hen becomes essential to finalize the job of completion of the construction, the hen undertakes the interior finishing after mating; male polygamous while on the nest; clutch consists of 2-3 eggs; incubation done by the female only, incubation period 14-15 days; female tends the brood, sometimes the male extends care to chicks and feeds.

Voice and calls: During nest-building emits harsh long-drawn call 'chee-wiz.'

RED MUNIA OR AVADAVAT 312. *Estrilda amandava amandava* (Linnaeus)

1758. *Fringilla Amandava* Linnaeus, *Syst. Nat.* ed. 10, 1:180. Type-locality: Eastern India = Calcutta.

Local names: Sūrākh (Gujarati); Lāl, Lāl mūniā (Hindi).

Recognition: A very small streamlined bird with a conspicuous bright red, short conical bill-male reddish, female brown and yellow, both spotted with white; size appreciably smaller than the House Sparrow (length 100 mm).

Male (breeding): Whole plumage crimson; wing and tail dark brown flight-feathers tipped with white; sides of neck, breast and body spotted with white; in non-breeding season the male more or less resembles the female.

Female: Upper plumage brown; upper tail-coverts red mixed with white; wings and tail dark brown; chin and throat whitish; breast greyish, under tail-coverts orange.

Iris orange-red; bill red; legs and feet fleshy brown.

Distribution: Indian subcontinent, found throughout India including the arid and semi-arid tracts of northwestern India.

Habits and habitat: Resident; keeps in flocks of a dozen or two, sometimes mixed with other munias; affects wet areas that support patches of reeds, tall grass jungles, millet crops and sugarcane, tame and confiding; seen perching on tops of grass and reeds during flowering season; roosts communal in reed beds; food comprises grass-seeds, also millets; breeds from July to October; often raises two broods; nest-a large melon-shaped structure with fine grass and down feathers, placed at the bases of thick bushes or clumps of reeds or in thorny bush, about a metre high from the ground; clutch consists of 5-6 eggs; nest built by both sexes; only female incubates.

Voice and calls: Emits a series of shrill chirp 'chic-chic' or squeak, sometimes continuously twitters on perch.

WHITETHROATED MUNIA

313. *Lonchura malabarica malabarica* (Linnaeus)

1758. *Loxia malabarica* Linnaeus, *Syst. Nat.*, ed. 10, 1:175. Type-locality: Indiis (= India).

Local names: Pāvāi muniā (Gujarati), Chārchāra, Chārgā, Chārkkā, Piddā (Hindi).

Recognition: A small brown munia with a heavy conical bill; long, pointed and graduated tail, and a white rump; smaller than the House Sparrow (length 100 mm). Sexes alike.

Upper plumage dull earthy brown; wings bluish, outer feathers black; upper tail-coverts white; tail blackish with feathers rusty-edged; under parts pale buff-white, flanks cross-barred with black to rusty.

Iris brown; bill grey; legs and feet dark-brown.

Distribution: Indian subcontinent, found practically all over India including the arid and semi-arid tracts of northwestern India; locally migratory, depending upon the availability of food and water.

Habits and habitat: Resident; common; keeps in flocks of 15 -20; fairly bold and confiding; affects open semi-desert country, supporting scrubby and thorny complex, bushes of tall grass; forages on ground and in grassy meadows and low shrubs, light jungles; food comprises grass-seeds, nectar of flowers, insects; breeds practically throughout the year but usually from July to September; nest — ball-shaped, with a small lateral entrance made of grass, generally of *Arstida* sp. and lined with feathery and fluffy seeds, and cotton wool, placed in the centre of a thorny bush or on small tree overhanging water for protecting the brood from predators; at times deserted nest of weaver birds utilized for nesting; clutch consists of 4-5 eggs; both sexes build the nest, incubate and tend the brood.

Voice and calls: Emits a twittering cheep and a short whistle.

SPOTTED MUNIA

314. *Lonchura punctulata punctulata* (Linnaeus)

1758. *Loxia punctulata* Linnaeus, *Syst. Nat.*, ed. 10, 1:173. Type-locality: Asia = Calcutta.

Local names: Bhārāti Tāpkāvāli Muniā (Gujarati); Teliā Muniā, Seenābāz (Hindi).

Recognition: A small chocolate-brown bird, with dark scale markings below; tail long, graduated and pointed; bill conical and heavy; smaller than the House Sparrow (length 100 mm); Sexes alike.

Upper plumage and wings light chocolate, rump barred with brown; upper tail-coverts bright yellow; tail olive-yellow; lores, cheeks, chin and throat fulvous brown giving a scaled appearance; flanks with grey circles or semi-circles.

Iris reddish brown; bill slaty black; legs and feet slaty grey.

Distribution: Indian subcontinent, found throughout the Indian plains except the arid areas of northwestern India and Western India; found in the semi-arid tracts of Punjab, Haryana, central and south Rajasthan, and Gujarat.

Habits and habitat: Resident and locally migratory; gregarious; rather uncommon; during winter large flocks congregate and fall on standing crop or feed on ground; flight undulating; roosts in large numbers with other species of munias, sparrows and weaver birds in thicket of millets, sugarcane and grass; food comprises grass-seeds, cereals and berries; breeding not recorded from the semi-arid regions of northwest India.

Voice and calls: Emits impatient notes 'kitty-kitty-kitty'

TRUMPETER BULLFINCH

315. *Carpodacus githaginea crassirostris* Blyth

1847. *Carpodacus crassirostris* Blyth, *J. Asiat. Soc. Beng.* 16:476. Type-locality: Afghanistan.

Local names: Gūlābi tūti (Hindi).

Recognition: A sparrow-like pink-brown bird with a heavy and short bill, long wings, size that of the House Sparrow (length 150 mm).

Male: Head ashy grey; upper plumage greyish brown with pink tinge; wings and rump pink; tail chocolate-brown; underparts light grey washed with pink.

Female: In winter resembles the male but without any pink.

Iris brown; bill deep orange; legs and feet brown.

Distribution: Palearctic, winters in northwest India including Punjab, Haryana and Rajasthan.

Habits and habitat: Winters from December to February; rather uncommon; keeps in pairs or small flocks; affects bare rocky hills in arid and semi-arid areas; feeds on ground in broken rocky country; food comprises wild seeds; flight strong, somewhat undulating.

Voice and calls: Emits a long twittering call 'trunk-et-sea', sometimes chirps and croaks.

TURKESTAN ROSEFINCH

316. *Carpodacus erythrinus ferghanensis* (Kozlova)

1939. *E. (rythrina) e. (rythrina) ferghanensis* Kozlova, *Bull. Soc. Nat. Moscoa* 48:63. Type-locality: Shah-dara, Tadzhik, S S R.

Local names: Gūlābi (Gujarati); Tuti, Lāl tūti (Hindi).

Recognition: A rose-pink bird with a heavy conical bill; female browner, streaked with dark brown below; size that of the House Sparrow (length 150 mm).

Male: Upper plumage crimson edged with rufous to brick-red; head and rump deep crimson; wings and tail brown; a paler rufous brown eye-stripe; chin, throat and breast rosy pink; abdomen dull pink; under tail-coverts whitish.

Female: Whole plumage olive-brown; wing bears two pale wing-bars; throat and breast; whitish, streaked with brown; abdomen whitish.

Irish dark-brown; bill horny above, silvery grey below; legs and feet dusky brown.

Distribution: Palaearctic, winter visitor to the plains of north-western and western India including the arid and semi-arid parts of Punjab, Haryana, Rajasthan, northern Gujarat, Saurashtra and Kutch.

Habits and habitat: Winters from November to March; rather uncommon; affects open country and light forests; keeps in pairs; forages in babul (*Acacia* spp.) patches, thorny scrubs and tamarisk along water course; shy and quiet; food comprises wild fruits and seeds, also nectar of flowers.

Voice and calls: Generally silent in winter but in spring emits a call note 'twee-ee-to-wee'

BLACKHEADED BUNTING 317. *Emberiza melanocephala* Scopoli

1769. *Emberiza melanocephala* Scopoli, *Annus I, Hist. Nat.*: 142. Type-locality: Carniola.

Local names: Kālā Māthāno Gāndām (Gujarati); Gāndām (Hindi).

Recognition: A blackheaded, chestnut-brown and yellow bird (male), female streaked brown; size between sparrow and bulbul (length 180 mm).

Male: Whole crown and sides of the head black; nape (collar) yellowish; upper plumage orange-chestnut; upper tail-coverts brown, wings and tail dark brown; chin and underparts yellowish.

Female: Much like the House Sparrow, upper plumage fulvous-brown streaked with dark-brown, lower plumage light fulvous; under tail-coverts yellowish.

Iris dark brown; bill brownish green; legs and feet fleshy brown.

Distribution: Palaearctic, winter visitor to western and central India including the arid and semi-arid tracts of southern Rajasthan, northern Gujarat, Saurashtra and Kutch.

Habits and habitat: Winters in the plains from September to March; keeps in flocks of 15-20 individuals, sometimes gets mixed up with other buntings; affects cultivation and scrub jungles, standing crop of millets and wheat, causing appreciable damage to crop, also collects morsel from stubbles and bullock-cart road in countryside; food comprises grass-seeds and cultivated grains; quite bold and obstinate as sparrows, on slight alarm leaves crop-fields to take refuge in nearby leafy trees and again falls on crop to continue its feeding activities.

Voice and calls: Emits a musical note 'tweet'

REDHEADED BUNTING
318. *Emberiza bruniceps* Brandt.

1841. *Emberiza bruniceps* Brandt, *Bull. Sci. Acad. Imp. St. Petersb.* 9, col. 12. Type-locality: Turkmenia.

Local names: Lāl mǎthāno-Gāndām (Gujarati); Gāndām (Hindi).

Recognition: A chestnut-headed Bunting with much yellow in the plumage; female like the Blackheaded; size between sparrow and the bulbul (length 170 mm).

Male: Head rusty red to golden brown; upper-back yellow, mid-back yellowish olive, streaked with black; rump sulphur-yellow; wings brown, bear whitish double wing-bars; underparts yellow streaked with brown.

Female: Upperparts brown streaked with dark brown; underparts buff-yellow; under tail-coverts yellow.

Iris brown; bill dark brown above slaty grey below; legs and feet horny brown.

Distribution: Palaearctic, winters in the plains of greater part of the Indian Peninsula including Haryana, Rajasthan and Gujarat.

Habits and habitat: Winters from October to March; rather common, found in small numbers often mixed up with the Blackheaded Bunting; affects cultivated crop of millets; food comprises largely cultivated seeds.

Voice and calls: Emits a musical call note 'tweet'

WHITECAPPED BUNTING
319. *Emberiza stewarti* (Blyth)

1854. *Euspiza Stewarti* Blyth, *J. Asiat. Soc. Beng.* 23:215. Type-locality: Landour and Dehra Dun, western Uttar Pradesh.

Local names: Sādo mǎthāno Gāndām (Gujarati); Gāndām (Hindi).

Recognition: A chestnut sparrow-like bird with a sharply conical bill; greyish white crown and blackish marks on face conspicuous in male; female dull brown with dark streaks; size that of the House Sparrow (length 150 mm).

Male: Head grey; cheeks white; a conspicuous black eye-stripe running to the nape; a chestnut band across the breast; upper plumage chestnut, feathers scalloped with buff; tail brown; outer tail-feathers white; breast white, abdomen pale fulvous.

Female: Upper plumage ashy brown; head greyish brown; eye-stripes from lores to nape deeper brown; cheeks brown; wings brown; rump rufous-chestnut; tail brown margined with rufous, outer feathers white; breast rufous, lower plumage pale fulvous streaked with brown.

Iris dark brown; bill dark brown above, paler below; legs and feet fleshy brown.

Distribution: Palaearctic, winter visitor to the plains of northwestern and central western India, patchily distributed in the arid and semi-arid tracts of northwestern India.

Habits and habitat: Winters from September to March; rather uncommon; found in small scattered flocks sometimes mixed with other buntings; affects scrub jungles nearabout cultivation; forages on ground but perches on trees and bushes; food comprises small grass seeds; quite alert, on least suspicion takes refuge in nearby bushes or in trees.

Voice and calls: Emits a short note 'tit' or twitters like a sparrow.

GREYNECKED BUNTING 320. *Emberiza buchanani buchanani* Blyth

1845(1844). *E. (mbariza) Buchanani* Blyth, *J. Asiat. Soc. Beng.* 13:957. Type-locality: Indian Peninsula.

Local names: Pathraral Gāndām (Gujarati); Jāmjhārā (Hindi).

Recognition: A brown, grey-headed bird much like the sparrow with a white ring round eyes and a forked tail (male), female duller; size that of the House Sparrow (length 150 mm).

Male: Head and neck light ashy grey; a dark brownish stripe from bill to lower face; upper parts brown tinged with rufous, back streaked with dark brown; outer tail-feathers white; underparts orange-buff.

Female: Much paler.

Iris brown; **bill** pale brown; **legs and feet** pale yellow or fleshy-coloured.

Distribution: Palaearctic, winters in the plains of northern Gujarat including Saurashtra and Kutch, and spreads to western Uttar Pradesh and south to Karnataka.

Habits and habitat: Winter visitor, arrives in September and departs in April; not common; keeps in flocks of a dozen birds, often mixed with other buntings; generally settles on ground, or taking refuge in trees, much like pipits; affects open, arid, rocky and broken country, thorny and scrubby vegetation of akra (*Euphorbia*) and ber (*Zizyphus*) complex; food comprises grass and weed seeds.

Voice and calls: Wintering birds generally silent, sometimes emits a faint 'click'

STRIOLATED BUNTING 321. *Embritiza striolata striolata* (Lichtenstein)

1823. *F. (ringilla) striolata* (Lichtenstein) Verz. Daubl. Mus. Berling: 24. Type-locality: Ambukol, Nubia.

Local names: Lāherio Gāndām (Gujarati).

Recognition: A small brownish bird with a grey head, streaked with black; female slightly duller; size between sparrow and munia (length 140 mm).

Male: Head greyish white streaked with black; upperparts brown streaked with dark-brown; wings rufous; sides of head (face) bear three white streaks followed by a black stripe behind eyes; underparts (except abdomen) greyish white streaked with black; abdomen fulvous buff.

Female: Head brown with darker streaks.

Distribution: Indian subcontinent, restricted more or less to northwest India including the arid and semi-arid tracts of Punjab, Haryana, Rajasthan and Gujarat, also extending as far east as Uttar Pradesh and south to northern Maharashtra.

Habits and habitat: Resident with local movements; not uncommon keeps in flocks; affects rocky and stony, dry scrubland, open bare hills and sandy terrain specially in reddish brown soil, also in reed-beds close to water; often seen roosting on ground; flight low above the ground; a strong flier, appears in a particular area all on a sudden and disappears in a moment; a ground feeder; hops about to forage mostly in the vicinity of water-tanks, ponds and puddles, canals and rivers; food comprises grass seeds.

Voice and calls: Utters a distinctive note 'witch-witch-te-vickky-witch'

CRESTED BUNTING 322. *Melophus lathami* (J.E. Gray)

1831. *Emberiza lathami* J.E. Gray, *Zool. Misc.* 1:2. Type-locality: Canton, Kwangtung, China.

Local names: Mor-chākli; Kāthāi-pānkh (Gujarati); Pāthār-chiriā-(Hindi).

Recognition: A small black bird with chestnut wing and tail and conspicuous pointed crest; female much paler; size that of the sparrow (length 150 mm).

Male: Head, mantle and crest black, wings, tail and thigh chestnut; underparts black.

Female: Upper plumage dark-brown, feathers streaked brown; crestless conspicuous and shorter; wings and tail dark brown, edged rufous; underparts yellowish buff; throat and breast mottled with dark brown; undertail-coverts rufous.

Iris dark brown; bill black; legs and feet fleshy brown.

Distribution: Indian subcontinent, found in greater parts of the Indian Peninsula including the arid and semi-arid tracts of Haryana, eastern and central Rajasthan, and Saurashtra.

Habits and habitat: Resident and locally migratory; keeps singly, sometimes in groups of 4-6 individuals or more; fairly bold and active; affects rocky and hilly low scrub jungles, and open cultivation in valleys; perches on tops of bushes but forages on ground throughout the day, keeping its head erect and breast upright and crest erect and pointed, much like the crow-pheasant style; roosts in hedges and thorny thickets; food comprises small grass seeds; breeds from April to August; nests in holes and hollows in walls, space under rocks, crevices, vertical sand walls by river or canal side; nest-a shallow saucer made of grass roots and blades lined with fine soft grass, rootlets, cotton and hair; clutch consists of 3-4 eggs; only female incubates.

Voice and calls: Emits repeated laudable notes 'which-which-which-whee-we-we-which'

List of species and their status (including rare, straggler and Vagrant) in arid and semi-arid tracts (Statewise). Species marked with an asterix (*) have not been described in the text. Abbreviations used: C=common; FC=Fairly common; UC=Uncommon; R=Rare; S=Straggler; V=Vagrant; Rr=Resident; WV=Winter visitor; LM=Locally migratory; O=Order; F=Family; SF=Subfamily.

1	2	3	4	5	6		
Sl. No.	Scientific name	South- e a s t Harya na	South Punjab	Rajasthan West (a)	South Central (b)	Gujarat Kathiawar (c)	Kutch (d)
	O.Podicipediformes F. Podicipedidae	FC	FC	FC	FC	UC	UC
1.	Podiceps cristatus						
	cristatus (Linnaeus)(WV).						
2.	Podiceps nigricollis Brehm	-	-	-	-	UC	R
	(WV).						
3.	Podiceps ruficollis capensis						
	Salvadori (Rr).	C	C	C	C	C	C
	O.Pelecaniformes F. Pelecanidae						
4.	Pelecanus onocrotalus						
	Linnaeus(WV)	-	-	-	UC	UC	R
5.	Pelecanus philippensis						
	crispus Gmelin (WV)	C	C	UC	UC	R	R
	F. Phalacrocoracidae						
6.	Phalacrocorax carbo						
	sinensis (Shaw) (LM)	C	C	UC	C	C	C
7.	Phalacrocorax fuscicollis						
	Stephens (LM)	C	UC	UC	UC	UC	UC
8.	Phalacrocorax niger						
	(Vieillot) (Rr)	C	C	C	C	C	C
9.	A n h i n g a r u f a						
	melanaogaster Pennant						
	(Rr)	C	UC	UC	UC	C	FC
	O. Ciconiiformes F. Ardeidae						
10.	Ardea cinerea rectirostris						
	Gould (Rr)	C	C	C	C	C	C

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
11.	<i>Ardea prupurea manilensis</i> Meyen (LM)	C	UC	UC	C	C	C
12.	<i>Ardea alba modesta</i> J.E. Gray (Rr)	C	UC	UC	C	UC	UC
13.	<i>Ardeola striatus chloriceps</i> (Bonaparte) (LM)	UC	UC	+ -	UC	UC	UC
14.	<i>Ardeola grayii grayii</i> (Sykes) (Rr)	C	C	C	C	C	C
15.	<i>Bubulcus ibis coromandus</i> (Boddaert) (Rr)	C	C	UC	FC	C	C
16.	<i>Egretta intermedia</i> <i>intermedia</i> (Wagler) (Rr)	FC	UC	UC	FC	FC	FC
17.	<i>Egretta garzetta garzetta</i> (Linnaeus) (Rr)	UC	UC	UC	C	C	C
18.	<i>Nycticorax nycticorax</i> <i>nycticorax</i> (Linnaeus) (Rr)	C	FC	UC	FC	FC	FC
	<i>*Ixobrychus minutus</i> (Linnaeus) (LM)	UC	UC	R	R	R	R & V
	<i>*Ixobrychus sinensis</i> (Gmelin) (LM)	UC	R	R	R	R	R
	<i>* Dupetor flavicollis</i> (Latham) (LM)	V	V	V	V	V	V
19.	<i>Botarus stellaris stellaris</i> (Linnaeus) (WV) F. Ciconiidae	UC	UC	R	UC	UC	UC
20.	<i>Mycteria leucocephala</i> (Pennant) (Rr, LM)	FC	FC	UC	FC	FC	FC
21.	<i>Anastomus oscitans</i> (Boddaert) (Rr, LM)	UC	UC	UC	UC	FC	FC
22.	<i>Ciconia episcopus</i> <i>episcopus</i> (Boddaert) (Rr)	UC	UC	UC	UC	R	R
23.	<i>Ciconia ciconia ciconia</i> (Linnaeus) (WV)	-	-	-	-	-	R
24.	<i>Ciconia nigra</i> (Linnaeus) (WV)	UC	UC	R	R	R	R
25.	<i>Ephippiorhynchus asiaticus</i> <i>asiaticus</i> (Latham) (R)	UC	UC	-	UC	UC	UC
	<i>* Leptoptilos dubius</i> (Gmelin) (LM)	-	-	-	-	R	R

1	2	3	4	5	6	
				(a)	(b)	(c) (d)
	* <i>Leptoptilos javanicus</i> (Horsfield) (Rr, LM)	-	-	-	-	R -
	F. Threskiornithidae					
26.	<i>Threskiornis aethiopica</i> <i>melanocephala</i> (Latham) (LM)	FC	UC	UC	FC	FC FC
27.	<i>Pseudibis papillosa</i> <i>papillosa</i> (Temminck) (Rr)	FC	FC	UC	FC	FC FC
28.	<i>Plegadis falcinellus</i> <i>falcinellus</i> (Linnaeus) (Rr, LM)	FC	FC	R	UC	UC UC
29.	<i>Platalea leucorodia major</i> Temminck & Schlegel (Rr, LM)	C	C	FC	FC	FC C
30.	<i>Phoenicopterus roseus</i> Pallas (Rr, LM)	UC	UC	FC	UC	FC C
31.	<i>Phoeniconaias minor</i> (Geoffroy) (LM)	-	-	UC	UC	UC FC
	O. Anseriformes					
	F. Anatidae					
	* <i>Anser albifrons</i> (Scopoli) (WV)	-	-	-	-	- S
32.	<i>Anser anser rubrirostris</i> Swinhoe (WV)	UC	UC	UC	R	R R
33.	<i>Anser indicus</i> (Latham) WV)	FC	FC	UC	R	R R
	* <i>Cygnus cygnus jankowskii</i> Alpheraky (WV)	-	-	-	-	- S
34.	<i>Dendrocygna javanica</i> (Horsfield) (Rr)	FC	FC	FC	FC	FC FC
	* <i>Dendrocygna bicolor</i> (Vieillot) (Rr, LM)	R	R	R	R	R R
35.	<i>Tadorna ferruginea</i> (Pallas) (WV)	UC	UC	R	R	V V
36.	<i>Tadorna tadorna</i> (Linnaeus) (WV)	R	R	R	R	V V

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
	* <i>Marmaronetta angustirostris</i> (Ménétriès) (WV)	UC	UC	UC	UC	R&S	R&S
37.	<i>Anas acuta</i> Linnaeus (WV)	FC	FC	FC	FC	FC	FC
38.	<i>Anas crecca crecca</i> Linnaeus (WV)	C	C	C	C	C	C
39.	<i>Anas poecilorhyncha poecilorhyncha</i> J.R. Forster (WV)	C	C	C	FC	FC	FC
40.	<i>Anas platyrhynchos</i> Linnaeus (WV)	FC	FC	FC	UC	UC	UC
41.	<i>Anas strepera strepera</i> Linnaeus (WV)	C	C	C	C	C	V
	* <i>Anas falcata</i> Georgi (WV)	-	-		-	-	V
42.	<i>Anas panelope</i> Linnaeus (WV)	C	C	FC	C	FC	FC
43.	<i>Anas querquedula</i> Linnaeus (WV)	C	C	C	C	C	C
44.	<i>Anas clypeata</i> Linnaeus (WV)	C	C	C	C	C	C
45.	<i>Netta rufina</i> (Pallas)(WV)	C	C	FC	FC	FC	FC
46.	<i>Aythya ferina</i> (Linnaeus) (WV)	C	C	CF	FC	FC	FC
47.	<i>Aythya nyroca</i> (Guldenstadt) (WV)	UC	UC	UC	FC	FC	FC
48.	<i>Aythya fuligula</i> (Linnaeus) (WV)	FC	FC	FC	FC	FC	FC
49.	<i>Nettapus coromandelianus coromandelianus</i> (Gmelin) (Rr)	C	C	C	C	FC	FC
50.	<i>Sarkidiornis melanotos</i> (Pennant) (Rr)	UC	UC	UC	UC	UC	UC
	* <i>Oxyura leucocephala</i> (Scopoli)	R	-	-	R	-	-
	O. Falconiformes F. Accipitridae						
51.	<i>Elanus caeruleus vociferus</i> (Latham) (Rr)	FC	UC	UC	R	R	R

1	2	3	4	5		6	
				(a)	(b)	(c)	(d)
	* <i>Pernis ptilorhynchus</i> Lesson (WV)	-	-	-	-	UC	UC
52.	<i>Milvus milvus milvus</i> (Linnaeus) (WV)	UC	UC	UC	UC	VR	VR
53.	<i>Milvus migrans govinda</i> (Sykes) (Rr)	C	C	C	C	C	C
54.	<i>Milvus migrans lineatus</i> (Gray) (WV)	-	-	UC	UC	UC	UC
55.	<i>Haliastur indus indus</i> (Boddaert) (R & LM)	UC	UC	UC	UC	UC	UC
56.	<i>Accipiter gentilis schvedowi</i> (Menzbier) (WV)	-	-	-	-	R	R
57.	<i>Accipiter badius</i> <i>dussumieri</i> (Temminck) (Rr, LM)	C	C	C	FC	FC	FC
58.	<i>Accipiter nisus nisosimilis</i> (Tickell) (WV)	-	-	-	-	-	R
	* <i>Accipiter virgatus affinis</i> Hodgson (WV)	-	-	-	-	-	V
59.	<i>Buteo rufinus rufinus</i> (Cretzschmar) (WV)	C	C	C	C	C	UC
	* <i>Buteo buteo burmanicus</i> Hume (WV)	-	-	FC	FC	-	-
60.	<i>Butaster teesa</i> (Franklin) (Rr)	FC	CC	FC	FC	FC	FC
61.	<i>Hieraaetus fasciatus</i> <i>fasciatus</i> (Vieillot) (Rr)	FC	FC	FC	FC	UC	UC
62.	<i>Hieraaetus pennatus</i> (Gmelin) (? Rr)	FC	FC	FC	UC	UC	R
63.	<i>Aquila heliaca heliaca</i> Savigny (WV)	R	-	R	-	-	V & R
64.	<i>Aquila rapax vindhiana</i> Franklin (Rr)	FC	FC	FC	FC	FC	FC
	* <i>Aquila nipalensis</i> <i>nipalensis</i> (Hodgson) (WV)	-	-	-	-	-	V
65.	<i>Aquila clanga</i> Pallas (WV)	UC	UC	UC	UC	UC	UC

1	2	3	4	5		6	
				(a)	(b)	(c)	(d)
66.	<i>Haliaeetus albicilla</i> (Linnacus) (WV)	-	-	-	-	UC	-
67.	<i>Haliaeetus leucoryphus</i> (Pallas) (Rr)	FC	UC	UC	FC	FC	R
68.	<i>Sarcogyps calvus</i> (Scopoli) (Rr)	FC	FC	FC	FC	FC	FC
69.	<i>Aegypius monachus</i> (Linnaeus) (Rr)	R	R	R	R	R	R
70.	<i>Gyps fulvus fulvescens</i> Hume (Rr)	FC	FC	UC	UC	UC	UC
71.	<i>Gyps indicus indicus</i> (Scopoli) (Rr)	FC	FC	FC	FC	FC	FC
72.	<i>Gyps bengalensis</i> (Gmelin) (Rr)	C	C	C	C	C	C
73.	<i>Neophron percnopterus</i> <i>percnopterus</i> (Linnaeus) (Rr)	FC	FC	FC	FC	UC	UC
74.	<i>Circus macrourus</i> (S.G.Gmelin) (WV)	FC	FC	FC	FC	FC	FC
75.	<i>Circus pygargus</i> (Linnaeus) (WV)	C	C	C	FC	FC	FC
76.	<i>Circus aeruginosus</i> <i>aeruginosus</i> (Linnaeus) (WV)	FC	FC	UC	FC	FC	FC
77.	<i>Circus gallicus gallicus</i> (Gmelin) (Rr)	-	UC	UC	UC	-	-
78.	<i>Spilornis cheela melanotis</i> (Jerdon) (Rr)	UC	UC	R	UC	UC	R
79.	<i>Pandion haliaetus haliaetus</i> (Linnaeus) (WV)	UC	UC	UC	UC	UC	UC
80.	<i>Falco biarmicus cherrug</i> J.E. Gray (Wv)	R	R	R	R	R	R
81.	<i>Falco biarmicus jugger</i> J.E.Gray (Rr)	FC	FC	FC	FC	FC	FC
82.	<i>Falco peregrinus</i> <i>babylonicus</i> Sclater (WV)	UC	UC	UC	-	R	R
83.	<i>Falco peregrinus</i> <i>peregrinator</i> Sundevall (WV)	C	C	C	C	UC	UC
84.	<i>Falco subbuteo subbuteo</i> Linnaeus (WV)	UC	UC	UC	UC	R	R
85.	<i>Falco chicquera chicquera</i> Daudin (Rr)	FC	FC	FC	FC	C	C

1	2	3	4	5		6	
				(a)	(b)	(c)	(d)
	*Falco vespertinus amaurensis Radee (WV)	-	-	-	UC	UC	-
	*Falco naumanni pekinensis Swinhoe (WV)	-	-	-	UC	UC	-
86.	Falco tinnunculus tinnunculus Linnaeus (WV)	C	C	C	C	FC	FC
	O. Galliformes F. Phasianidae						
87.	Francolinus francolinus asiae Bonaparte (Rr. LM)	UC	UC	UC	UC	R	R
88.	Francolinus pictus pallidus (J.E.Gray) (Rr)	R	R	R	FC	FC	R
89.	Francolinus pondicerianus interpositus Hartert	C	C	C	C	C	C
90.	Coturnix coturnix coturnix (Linnaeus)	C	C	C	FC	FC	FC
91.	Coturnix coromandelica (Gmelin) (LM)	FC	FC	FC	FC	FC	FC
92.	Perdicula asiatica asiatica (Latham)	-	-	-	UC	UC	-
93.	Perdicula argoondah meinertzhageni Whistler (Rr)	FC	FC	FC	FC	FC	FC
94.	Galloperdix spadicea caurina Blanford (Rr)	R	R	R	R	R	R
95.	Gallus sonneratii Temminck	-	-	-	UC	UC	-
96.	Pavo cristatus Linnaeus (Rr)						
	O. Gruiformes F. Turnicidae						
97.	Turnix sylvatica dussumier (Temminck) (Rr, LM)	UC	UC	UC	UC	UC	UC
98.	Turnix tanki tanki Blyth (Rr)	FC	FC	FC	FC	FC	UC
99.	Turnix suscitator taigoor Sykes (Rr)	FC	FC	FC	FC	FC	FC

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
F. Gruiformes							
100.	<i>Grus grus lilfordi</i> Sharpe (WV)	FC	FC	FC	FC	C	C
101.	<i>Grus antigone antigone</i> (Linnaeus) (Rr)	FC	UC	UC	UC	UC	R
102.	<i>Anthropoides virgo</i> (Linnaeus) (WV)	C	C	C	C	C	C
F. Rallidae							
103.	<i>Rallus striatus albiventer</i> Swainson (Rr, LM)	UC	UC	-	-	UC	UC
104.	<i>Rallus aquaticus korejewi</i> Zarudny (Wv)	UC	UC	-	UC	UC	-
105.	<i>Porzana porzana</i> (Linnaeus) (WV)	UC	UC	-		UC	R
106.	<i>Porzana pusilla pusilla</i> (Pallas) (WV)	R	R	-		R	-
107.	<i>Amaurornis phoenicurus phoenicus</i> (Pannant) (Rr, LM)	-	-	R	-	-	R
108.	<i>Amaurornis akool akool</i> (Sykes) (Rr)						
109.	<i>Gallicrex cinerea</i> (Gmelin) (Rr, LM)	R	R	R	R	R	R
110.	<i>Gallinula chloropus indica</i> Blyth (Rr, LM)	UC	UC	UC	UC	UC	UC
111.	<i>Porphyrio porphyrio poliocephalus</i> (Latham) (Rr, LM)	UC	UC	UC	UC	UC	UC
112.	<i>Fulica atra atra</i> Linnaeus (WV)	C	C	FC	FC	FC	C
F. Otidae							
113.	<i>Ardeotis nigriceps</i> (Vigors) (Rr)	R	R	UC	UC	R	UC
114.	<i>Chlamydotis undulata macqueenii</i> J.E.Gray (WV)	UC	UC	FC	FC	FC	FC
115.	<i>Sypheotides indica</i> (J.F. Miller) (Rr)	UC	UC	UC	UC	FC	FC
F. Jacanidae							
116.	<i>Hydrophasianus chirurgus</i> (Scopoli) (LM)	FC	UC	UC	UC	UC	UC

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
117.	Metopodius indicus (Latham) (Rr)	C	C	UC	C	C	UC
	F. Rostratulidae						
118.	Rostratula benghalensis benghalensis (Linnaeus) (Rr, LM)						
	F. Haematopodidae						
	*Haematopus ostralegus Linnaeus (LM)	UC	UC	UC	UC	UC	UC
	F. Recurvirostridae						
119.	Himantopus himantopus himantopus (Linnaeus) (LM)	UC	UC	C	C	C	C
120.	Recurvirostra avosetta Linnaeus (Wv,? Rr)	FC	FC	FC	FC	C	C
121.	Burphinus oedicnemus indicus (Salvadori) (Rr)	UC	FC	FC	FC	FC	FC
122.	Esacus magnirostris recurvirostris (Cuvier) (? Rr)	UC	UC	FC	FC	UC	UC
123.	Cursorius cursor cursor (Latham) (? Rr)	UC	UC	FC	FC	FC	FC
124.	Cursorius coromandelicus (Gmelin) (Rr, LM)	FC	FC	UC	UC	UC	UC
	F Charadriidae Charadriinae S.F.						
125.	Vanellus leucurus (Lichtenstein) (WV)	FC	FC	UC	UC	R	R
126.	Vanellus gregarius (Pallas) (WV)	FC	FC	C	C	UC	R
127.	Vanellus indicus indicus (Boddaert) (Rr)	C	C	C	C	C	C
128.	Vanellus malabaricus (Boddaert) (Rr)	FC	FC	FC	FC	FC	FC
129.	Pluvialis squatarola (Linnaeus) (WV)	-	-	-	-	UC	UC
130.	Charadrius leschenaultii leschenaultii Lesson (WV)	-	-	-	-	C	C

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
131.	Charadrius dubius jerdoni (Legge) (Rr, LM)	FC	FC	UC	UC	UC	UC
132.	Charadrius alexandrinus alexandrinus Linnaeus (WV)	-	-	UC	UC	UC	-
133.	Charadrius mongolus atrifrons Wagler (WV)	C	C	C	C	C	C
S.F. Scolopacinae							
134.	Numenius phaeopus phaeopus (Linnaeus) (WV)	UC	UC	UC	FC	FC	FC
135.	Numenius arquata orientalis C.L. Brehm (WV)	UC	UC	FC	UC	C	C
	*Limosa lapponica lapponia (Linnaeus) (WV)	-	-	-		UC	UC
136.	Limosa limosa limosa (Linnaeus) (WV)	FC	FC	FC	FC	C	C
	*Xenus cinereus cinereus (Guldenstadt)	-	-	-	-	-	R
	*Tringa erythropus (Vroef) (WV)	-	-	-	-	-	R
137.	Tringa totanus eurhinus (WV) (Oberholser)	FC	FC	FC	FC	FC	FC
138.	Tringa stagnatilis (Bechstein) (WV)	FC	FC	FC	FC	FC	FC
139.	Tringa nebularia Gunners (WV)	FC	FC	FC	FC	FC	FC
140.	Tringa ochropus Linnaeus (WV)	C	C	C	C	C	C
141.	Tringa glareola Linnaeus (WV)	FC	FC	FC	FC	FC	FC
142.	Tringa hypoleucos Linnaeus (WV)	C	FC	FC	FC	FC	FC
	*Arenaria interpres (Linnaeus) (WV)	-	-	-	-	-	R
143.	Gallinago gallinago gallinago (Linnaeus) (WV)	FC	FC	FC	FC	FC	FC

1	2	3	4	5		6	
				(a)	(b)	(c)	(d)
144.	<i>Gallinago minima</i> (Brunnich) (WV)	UC	UC	UC	UC	FC	FC
	* <i>Scolopax rusticola</i> Linnaeus (WV)	UC	UC	UC	R	UC	R
145.	<i>Calidris minuta minuta</i> (WV)	UC	UC	FC	FC	FC	UC
146.	<i>Calidris temminckii</i> Leisler (WV)	FC	FC	FC	FC	FC	FC
147.	<i>Calidris alpina alpina</i> (Linnaeus) (WV)	-	-	-	-	C	C
148.	<i>Calidris testacea</i> (Pallas) (WV)	-	-	C		C	C
149.	<i>Philomachus pugnax</i> (Linnaeus) (WV)	-	-	UC		UC	R
	F. Laridae						
150.	<i>Larus brunnicephalus</i> Jerdon (WV)	UC	UC	FC	FC	C	C
151.	<i>Larus ridibundus</i> <i>ridibundus</i> Linnaeus (WV)	UC	UC	FC	FC	FC	FC
152.	<i>Chlidonias hydrida indica</i> (Stephens) (WV)	UC	UC	FC	UC	FC	FC
153.	<i>Gelochelidon nilotica</i> (Gmelin) (WV)	UC	UC	FC	FC	C	C
154.	<i>Sterna aurantia</i> J.E. Gray (? Rr, LM)	FC	FC	FC	UC	UC	UC
155.	<i>Sterna acuticauda</i> J.E. Gray (WV)	-	-	-	R	UC	UC
156.	<i>Rynchops albicollis</i> Swainson (LM)	-	-	-	-	V	V
	Order Columbiformes F. Pteroclididae						
	* <i>Syrhaptes paradoxus</i> (V)	-	-	V	-	-	-
157.	<i>Pterocles alchata</i> <i>caudacutus</i> (S.G.Gmelin) (WV)	-	-	V	V	-	V
158.	<i>Pterocles exustus erlangeri</i> (Newmann) (Rr)	C	C	C	C	C	C

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
159.	<i>Pterocles senegallus</i> (Linnaeus) (WV)	UC	UC	FC	UC	UC	UC
160.	<i>Pterocles orientalis</i> <i>orientalis</i> (Linnaeus) (WV)	UC	UC	C	FC	UC	UC
161.	<i>Pterocles indicus indicus</i> (Gmelin) (Rr)	FC	FC	FC	FC	FC	FC
162.	<i>Treron phoenicoptera</i> <i>chloringaster</i> (Blyth) (Rr)	UC	UC	UC	UC	UC	UC
163.	<i>Columba livia intermedia</i> Strickland (Rr)	C	C	C	C	C	C
164.	<i>Columba eversmanni</i> (Bonaparte) (WV)	-	UC	UC	-	UC	-
	* <i>Streptopelia chinensis</i> <i>suratensis</i> (Gmelin) (Rr)	UC	-	-		UC	R
165.	<i>Streptopelia decaocto</i> <i>decaocto</i> (Fridvaldszky) (Rr)	C	C	C	C	C	C
166.	<i>Strptopelia tranquebarica</i> <i>tranquebarica</i> (Hermann) (Rr)	FC	FC	FC	FC	FC	FC
167.	<i>Streptopelia senegalensis</i> <i>cambayensis</i> (Gmelin) (Rr)	C	C	C	C	C	C
O. Psittaciformes							
F. Psittacidae							
168.	<i>Psittacula krameri borealis</i> (Neumann) (Rr)						
169.	<i>Psittacula cyanocephala</i> <i>bengalensis</i> (Foster) (Rr)	UC	UC	-	UC	UC	R
O. Cuculiformes							
F. Cuculidae							
170.	<i>Clamator jacobinus</i> <i>serratus</i> (Sparrman) (monsoon visitor)	FC	FC	FC	FC	FC	FC
171.	<i>Cuculus varius varius</i> Vahl (Rr, LM)	FC	FC	S	S	S	S
172.	<i>Cuculus canorus canorus</i> Linnaeus	FC	FC	FC	C	C	C

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
	*Cacomantis merulinus passerinus (Vahl) (Rr, LM)	-	-	-	R	-	-
	*Eudynamys scolopacea scolopacea (Linnaeus)	U	U		R	-	R
173.	Taccocua leschenaultii sirkee (J.E. Gray) (Rr)	-		UC	UC	R	R
174.	Centropus sinensis parroti Stresemann (Rr)	-	-	-	UC	UC	UC
	O. Stringiformes F. Stringidae						
175.	Tyto alba stertens (Hartert Rr)	UC	UC	R	UC	R	R
176.	Otus brucei (Hume) (LM)	-	R	-	-	-	R
177.	Otus bakkamoena gangeticus Ticehurst (Rr)	-		-	UC	-	-
178.	Otus bakkamoena marathe Ticehurst (Rr)	UC	-		UC	UC	-
179.	Otus scops turanicus (Lundon)	-	-	-	-	S	S
180.	Bubo bubo bengalensis (Franklin) (Rr)	FC	UC	UC	FC	FC	R
181.	Bubo coromandus coromandus (Latham) (Rr, LM)	UC	UC	UC	UC	R	-
182.	Bubo zeylonensis leschnault (Temminck) (Rr)	UC	-	-	UC	UC	-
183.	Athene brama indica (Franklin) (Rr)	C	C	C	C	C	C
184.	Stnx ocellata grisescens Koelz (Rr)	UC	UC	UC	UC	UC	-
185.	Asio flammeus flammeus (Pontoppidan) (WV)	UC	UC	FC	UC	FC	FC
	O. Caprimulgiformes F. Caprimulgidae						
186.	Caprimulgus indicus indicus Latham (R, LM)	FC	-	FC	FC	UC	-

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
187.	<i>Caprimulgus europeus unwini</i> Hume (WV)	FC	FC	S	FC	FC	FC
188.	<i>Caprimulgus maharattensis</i> Sykes (R, LM)	UC	UC	UC	UC	R	R
189.	<i>Caprimulgus asiaticus asiaticus</i> Latham (Rr, LM)	C	C	FC	C	C	FC
190.	<i>Caprimulgus affinis monticolus</i> Franklin (? Rr, LM)	UC	UC	UC	UC	UC	UC
191.	<i>Apus melba nubifuga</i> Koelz (WV)	-	-			UC	-
192.	<i>Apus affinis affinis</i> (J.E. Gray) (R, LM)	C	C	C	C	C	C
	O. Coraciiformes						
	F. Alcedinidae						
193.	<i>Alcedo atthis pallasii</i> Reichenbach (Rr, LM)	FC	FC	FC	FC	FC	?
194.	<i>Halcyon smyrnensis smyrnensis</i> (Linnaeus) (Rr)	C	C	C	C	C	C
195.	<i>Merops apiaster</i> Linnaeus (WV)	UC	UC	?	UC	S	
196.	<i>Merops superciliosus persicus</i> Pallas (Summer visitor)	FC	FC	FC	FC	FC	FC
197.	<i>Merops orientalis beludschicus</i> Newmann (WV)	-		UC		UC	UC
198.	<i>Merops oreintalis oreintalis</i> Latham (Rr)	C	FC	UC	C	C	FC
	F. Coraciidae						
199.	<i>Coracias garrulus semenowi</i> Loudon & Tschudi (Summer visitor)	-	-	UC	UC	UC	UC
200.	<i>Coracias benghalensis benghalensis</i> (Linnaeus) (Rr)	FC	FC	FC	FC	FC	FC
	Family Upupidae						
201.	<i>Upupa epops epops</i> Linnaeus (WV)	FC	FC	FC	FC	FC	FC
	F. Capitonidae						
202.	<i>Megalaima haemacephala indica</i> (Latham) (Rr)	FC	UC	UC	FC	FC	R

1	2	3	4	5	6	
				(a)	(b)	(c) (d)
203.	<i>Megalaima zeylanica caniceps</i> (Franklin) (Rr)	-	-	-	UC	UC -
	F. Picidae					
204.	<i>Jynx torquilla torquilla</i> Linnaeus (WV)	FC	FC	FC	FC	FC
205.	<i>Picus myrmecophoneus</i> Stresemann (Rr)	-	-	-	UC	UC -
206.	<i>Dinopium benghalense dilutum</i> (Blyth) (Rr)	UC	-	UC	FC	FC R
207.	<i>Picoides mahrattensis mahrattensis</i> (Latham) (Rr)	FC	FC	FC	FC	FC
208.	<i>Picoides nanus nanus</i> (Vigors) (Rr)	UC			UC	UC -
	O. Passeriformes					
	F. Pittidae					
209.	<i>Pitta brachyura brachyura</i> (Linnaeus) (Rr)	-	-		FC	FC -
210.	<i>Mirafra javanica cantillans</i> Blyth (Rr)	FC	FC	FC	FC	FC
211.	<i>Mirafra erythroptera sindiana</i> Ticehurst (Rr)	C	C	C	C	C
212.	<i>Ermopteryx grisea</i> (Rr, LM)	C	C	C	C	C
213.	<i>Ermopteryx nigriceps affinis</i> (Blyth) (Rr, LM)	FC	FC	C		-
214.	<i>Emmomanes phoenicurus phoenicurus</i> (Franklin) (Rr)	C	C	C	C	C
215.	<i>Alaemon alaudipes doriae</i> (Salvadori) (Rr, LM)	-	-			- FC
216.	<i>Calendrella cinerea longipennis</i> (Eversmann) (WV)	FC	FC	FC	FC	FC C
217.	<i>Calendrella raytal</i> (Blyth)	-	-	-	-	UC UC
218.	<i>Melanocorypha bimaculata torquata</i> Blyth	-	-	UC	-	- UC
219.	<i>Galerida cristata chendoola</i> (Franklin) (Rr)	UC	UC	FC	UC	FC
220.	<i>Galerida deva</i> (Skyes) (Rr)	C	C	C	C	C

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
221.	<i>Alauda gulgula inconspicua</i> Severtzov	UC	UC	UC	UC	UC	UC
	F. Hirundinidae						
222.	<i>Riparia riparia diluta</i> (Sharpe & Wyatt) (Rr)	FC	FC	FC	FC	FC	FC
223.	<i>Hirundo rupestris</i> Scopoli	UC	UC	UC	UC	UC	UC
224.	<i>Hirundo concolor concolor</i> Sykes (Rr)	FC	FC	FC	FC	FC	FC
225.	<i>Hirundo rustica rustica</i> Linnaeus (WV)	C	C	C	C	C	C
226.	<i>Hirundo smithii filifera</i> Stephens (Rr)	FC	FC	FC	FC	FC	FC
227.	<i>Hirundo fluvicola</i> Blyth (Rr)	FC	FC	UC	UC	UC	UC
228.	<i>Hirundo daurica</i> <i>erythropygia</i> Sykes (Rr)	C	C	C	C	C	C
	F. Laniidae						
229.	<i>Lanius excubitor lahtora</i> (Sykes) (Rr)	C	C	C	C	C	C
230.	<i>Lanius vittatus vittatus</i> Valenciennes (Rr, LM)	FC	FC	FC	FC	FC	C
231.	<i>Lanius collurio</i> Linne' (Autumn migrant)	-	-			FC	FC
232.	<i>Lanius schach</i> Linnaeus (Rr, LM)	FC	UC	UC	FC	FC	UC
	* <i>Lanius cristatus</i> <i>phoenicuroides</i> Severtz (WV)	-	-	UC	-	UC	UC
	F. Oriolidae						
233.	<i>Oriolus oriolus kundoo</i> Sykes (Rr, LM)	FC	UC	R	FC	UC	R
234.	<i>Dicrurus adsimilis</i> <i>albirictus</i> (Hodgson) (Rr)	-	-	-	FC	FC	-
	F. Dicruridae						
235.	<i>Sturnus roseus</i> (Linnaeus) (WV)	FC	FC	C	FC	FC	C
236.	<i>Sturnus vulgaris polaratskyi</i> Finsch (WV)	UC	UC	UC	UC	R	R

1	2	3	4	5		6	
				(a)	(b)	(c)	(d)
237.	<i>Acridotheres tristis tristis</i> (Linnaeus) (Rr)	C	C	UC	C	C	FC
238.	<i>Acridotheres ginginianus</i> (Latham) (Rr, LM)	C	FC	UC	UC	UC	UC
F. Corvidae							
239.	<i>Dendrocitta vagabunda pallida</i> (Blyth) (Rr)	FC	UC	UC	UC	FC	FC
240.	<i>Corvus splendens splendens</i> Vieillot (Rr)	C	C	C	C	C	C
241.	<i>Corvus corax subcorax</i> Severtzov (WV)		-			V	V
242.	<i>Corvus macrorhynchos culminatus</i> Sykes (Rr)	FC	UC	FC	FC	FC	UC
F. Campephagidae							
243.	<i>Tephrodornis pondicerianus pallidus</i> Ticehurst (Rr)	FC	UC	UC	FC	FC	FC
244.	<i>Pericrocotus ethologus favillaceus</i> Bangs & Phillips (WV)	C	C	-	C	C	C
245.	<i>Pericrocotus cinnamomeus pallidus</i> Baker (Rr)	FC	FC	FC	FC	FC	FC
246.	<i>Pericrocotus erythropygius erythropygius</i> (Jerdon) (Rr)	FC	FC	FC	C	C	FC
247.	<i>Aegithina tiphia humei</i> Baker (Rr)		UC	-	-	UC	-
248.	<i>Aegithina nigrolutea</i> (Marshall) (Rr)	FC	FC	UC	FC	FC	FC
249.	<i>Pycnonotus jocosus abuensis</i> (Whistler) (Rr)	-	-	-	-	UC	UC
250.	<i>Pycnonotus leucogenys leucotis</i> (Gould) (Rr)	C	C	C	C	- C	C
F. Muscicapidae S.F. Timaliinae							
251.	<i>Pycnonotus cafer humayuni</i> Deignan (Rr)	FC	FC	FC	C	C	C
252.	<i>Pomatorhinus horsfieldii obscurus</i> Hume (Rr)		-		UC	UC	-

1	2	3	4	5		6	
				(a)	(b)	(c)	(d)
253.	<i>Dumetia hyperythra</i> <i>abuensis</i> Harington (Rr)	-	-	-	UC	UC	-
254.	<i>Chrysomma einense</i> <i>hypoleucum</i> (Frnaklin) (Rr)	-	-	-	UC	R	R
255.	<i>Turdoides caudatus</i> <i>caudatus</i> (Dumont) (Rr)	C	C	C	C	C	C
256.	<i>Turdoides malcomi</i> (Sykes) (LM)	R	R	R	R	R	R
257.	<i>Turdoides striatus</i> <i>sindianus</i> Ticehurst (LM) Sub F. Muscicapinae	-	-	-	-	-	UC
258.	<i>Muscicapa striata sarudnyi</i> <i>Snigirewski</i> (autumn passage migrant)	FC	FC	FC	FC	FC	FC
259.	<i>Muscicapa parva parva</i> <i>Bechstein</i> (WV)	UC	UC	UC	FC	FC	UC
260.	<i>Muscicapa tickelliae</i> <i>tickelliae</i> (Blyth)	UC	-	-	UC	UC	-
261.	<i>Muscicapa thalassina</i> <i>thalassina</i> Swainson	-	-	-	UC	UC	-
262.	<i>Rhipidura aureola aureola</i> <i>Lesson</i> (?Rr)	UC	-	-	UC	UC	-
263.	<i>Terpsiphone paradisi</i> <i>paradisi</i> (Linnaeus)	-	-	-	UC	UC	R
S.F Sylviinae							
264.	<i>Prinia buchanani</i> Blyth (WV)	-	FC	FC	UC	-	FC
265.	<i>Prinia gracilis lepida</i> Blyth (Rr)	UC	UC	UC	UC	UC	UC
266.	<i>Prinia subflava terricolor</i> (Hume) (Rr)	FC	FC	FC	FC	FC	FC
267.	<i>Prinia sylvatica insignis</i> (Hume) (Rr)	FC	FC	FC	FC	FC	FC
268.	<i>Orthotomus sutorius</i> <i>guzuratus</i> (Latham) (Rr)	C	FC	FC	C	C	C
269.	<i>Acrocephalus stentoreus</i> <i>brunnescens</i> (Jerdon) (?WV)	-	-	-	-	UC	R
270.	<i>Acrocephalus dumetorum</i> <i>Blyth</i> (?Rr)	-	-	-	-	UC	UC

1	2	3	4	5		6	
				(a)	(b)	(c)	(d)
271.	<i>Acrocephalus agricola</i> <i>agricola</i> (Jerdon) (?WV)	UC	-	-	UC	UC	R
272.	<i>Acrocephalus melanopogon</i> <i>mimicus</i> Madarsz (WV)	-	-	-	-	UC	R
273.	<i>Hippolais caligata</i> rama (Sykes) (?WV) passage migrant)	FC	FC	FC	FC	FC	FC
274.	<i>Sylvia hortensis</i> jerdoni (Blyth) (WV)	FC	FC	FC	FC	FC	FC
275.	<i>Sylvia communis icterops</i> Menetries (autumn passage migrant)	FC	FC	FC	-	-	C
276.	<i>Sylvia curruca</i> minula Hume (WV)	C	C	C	C	C	C
277.	<i>Sylvia nana nana</i> (Hemprich & Ethrenberg) (WV)	UC	UC	UC	-	-	UC
278.	<i>Phylloscopus collybita</i> <i>tristis</i> Blyth (WV)	FC	FC	FC	FC	FC	FC
279.	<i>Phylloscopus griseolus</i> Blyth (WV)	FC	FC	FC	FC	FC	FC
280.	<i>Phylloscopus trochiloides</i> <i>nitidus</i> Blyth (Autumn passage migrant)	UC	UC	UC	UC	UC	UC
Turdinae							
281.	<i>Erythropygia galactotes</i> <i>familiaris</i> (Menetries) (Passage migrant)	FC	FC	FC	UC	UC	UC
282.	<i>Erithacus svecicus</i> <i>pallidogularis</i> Zarudny (WV)	FC	FC	FC	FC	FC	FC
283.	<i>Copsychus saularis saularis</i> (Linnaeus) (Rr)	UC	-	-	UC	UC	-
284.	<i>Cercomela fusca</i> (Blyth) (R)	C	C	C	C	FC	FC
285.	<i>Saxicola macrorhyncha</i> (Stoliczka)						
286.	<i>Saxicola torquata indica</i> (Blyth) (WV)	UC	UC	UC	R	R	R
287.	<i>Saxicola caprata bicolor</i> Sykes (WV)	FC	FC	FC	FC	UC	UC
288.	<i>Oenanthe isabellina</i> (Temminck) (WV)	UC	UC	UC	UC	R	R
289.	<i>Oenanthe xanthopyrna</i> <i>kingi</i> (Hume) (WV)	FC	FC	FC	FC	FC	FC

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
290.	<i>Oenanthe deserti deserti</i> (Temminck) (WV)	UC	UC	UC		-	UC
291.	<i>Oenanthe picata</i> (Blyth) (WV)	C	C	C	C	UC	UC
292.	<i>Saxicoloides fulicata</i> <i>cambaiensis</i> (Latham) (Rr)	C	C	C	C	C	C
	* <i>Turdus atrogularis</i> Jarocki (? WV)		-	-		-	-
293.	<i>Monticola solitarius</i> <i>pandoo</i> (Sykes) (WV)	-	-	-	UC	UC	R
	F. Paridae S.F. Parinae						
294.	<i>Parus major stupae</i> Koelz (Rr, ? LM)	UC	-	-	FC	FC	-
295.	<i>Parus nuchalis</i> Jerdon (Rr) F. Sittidae S.F. Salpornitinae	UC	FC	FC	UC	UC	UC
296.	<i>Salpornis spilonotus</i> <i>rajputanae</i> R A Mainertzhagen (Rr)	FC	FC	R	FC	R	-
	F. Motacillidae						
	* <i>Anthus trivialis trivialis</i> (Linnaeus) (WV)	-	-	-	UC	UC	-
297.	<i>Anthus novaeseelandiae</i> <i>waitei</i> Whistler (Rr)	UC	UC	UC	UC	UC	UC
298.	<i>Anthus campestris</i> <i>campestris</i> (Linnaeus) (WV)	C	C	C	C	C	C
299.	<i>Anthus similis decaptus</i> Meinertzhagen (WV)	FC	FC	FC	FC	FC	FC
300.	<i>Anthus spinoletta coutellii</i> Audouin (WV)	UC	-	-	UC	UC	-
301.	<i>Motacilla flava thunbergi</i> Billberg (WV)	FC	FC	FC	FC	FC	FC

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
	* <i>Motacilla feldegg melanogriseus</i> (Homeyer) (WV)	FC	UC	UC	UC	FC	UC
302.	<i>Motacilla citreola calcarata</i> Hodgson	FC	FC	FC	FC	FC	FC
303.	<i>Motacilla cinerea cinerea</i> Tunstall (WV)	FC	FC	UC	UC	UC	UC
304.	<i>Motacilla alba dukhunensis</i> Sykes (WV)	FC	FC	UC	UC	UC	UC
305.	<i>Motacilla maderaspatensis</i> Gmelin (Rr)	FC	FC	UC	FC	UC	UC
	F. Nectarinidae						
306.	<i>Nectarinia asiatica brevirostris</i> Blanford (Rr)	C	UC	UC	C	C	C
	F. Ploceidae S.F. Passerinae						
307.	<i>Passer domesticus indicus</i> Jardine & Selby (Rr)	C	C	C	C	C	C
308.	<i>Passer domesticus parkini</i> Whistler (Rr, LM)	-	-	-	R	R	-
309.	<i>Passer hispaniolensis transcaspicus</i> Tschusi (WV)	FC	FC	FC	-	-	-
310.	<i>Petronia xanthocollis transfuga</i> (Hertert) Rr, LM)	FC	UC	UC	FC	FC	FC
	S.F. Ploceinae						
311.	<i>Ploceus philippinus philippinus</i> (Linnaeus) (Rr) S.F. Estrildinae	UC	-	-	-	UC	-
312.	<i>Estrilda amandava amandava</i> (Linnaeus) (LM)	FC	FC	-	FC	FC	-
313.	<i>Lonchura malabarica malabarica</i> (Linnaeus) (LM)						
314.	<i>Lonchura punctulata punctulata</i> (Linnaeus) (LM)	UC	-	-	UC	UC	-

1	2	3	4	5	6		
				(a)	(b)	(c)	(d)
F. Fringillidae							
315.	Carpodacus githaginea crassirostris Blyth (WV)	UC	UC	-	UC	UC	-
316.	Carpodacus erythrinus farghanensis (Kozlova) (WV)	UC	UC	UC	UC	UC	UC
F. Emberizae							
317.	Emberiza melanocephala Scopoli (WV) passage migrant)	C	C	C	C	C	C
318.	Emberiza bruniceps Brandt (WV, passage migrant)	UC	UC	-	-	UC	UC
319.	Emberiza stewarti (Blyth) (WV)	UC	UC	-		R	R
320.	Emberiza buchanani Blyth (WV)	C	C	C	C	C	C
321.	Emberiza striolata striolata (Rr) (Lichtenstein)	C	C	C	C	C	C
322.	Melophus lathamii (J.E. Gray) (LM)	-	-	UC	UC	UC	-

REFERENCES

- Adam, R.M. 1873. Notes on birds of Sambar Lake and its vicinity. *Str. Feath.* 1; 361-404.
- Adam, R.M. 1874. Additional notes on the birds of Sambar Lake and its vicinity. *Str. Feath.* 2: 337-341; 456-466.
- Ali, S. 1941. The birds of Bahawalpur (Punjab). *J. Bombay nat. Hist. Soc.* 42:704-747.
- Ali, S. 1945. The birds of Kutch. Oxford University Press. Bombay.
- Ali, S. 1954-1955. The birds of Gujarat. *J. Bombay nat. Hist. Soc.* 52: 374-458; 735-802.
- Ali, S. 1959. Additions to the Birds of Kutch. *J. Bombay nat. Hist. Soc.* 56:635.
- Ali, S. 1960. The Cinereous Vulture [*Aegypius monachus* (Linnaeus)] an addition to the birds of Kutch. *J. Bombay nat. Hist. Soc.* 57: 408-409
- Ali, S. 1960. 'Flamingo City' revisited: nesting of the Rosy Pelican (*Pelecanus onocrotalus*) in the Rann of Kutch. *J. Bombay nat. Hist. Soc.* 57:412-415
- Ali, S. 1975. On some birds of the Indian Desert. In environmental analysis of the Thar

Desert. 423-431 (ed. R. Gupta and I. Prakash). Dehradun.

- Barnes, H.E. 1886. Birds nesting in Rajputana. *J. Bombay nat. Hist. Soc.* 1:38-62.
- Barnes, H.E. 1888. Nesting in western India. *J. Bombay nat. Hist. Soc.* 3:205-224.
- Barnes, H.E. 1889. Nesting in western Indian. *J. Bombay nat. Hist. Soc.* 4:1-21, 83-98, 237-255.
- Barnes, H.E. 1890. Nesting in western India. *J. Bombay nat. Hist. Soc.* 1-19, 97-116, 315-337.
- Biswas, B. 1947. On the collection of birds from Rajputana *Rec. Indian Mus.* 45:245-260
- Butler, E.A. 1875. Notes on the avifauna of Mount Aboo and northern Gujarat. *Str. Feath.* 3: 437-500.
- Butler, E.A. 1876. Notes on the avifauna of Mount Aboo and northern Gujarat. *Str. Feath.* 4: 1-41.
- Butler, E.A. 1877. Additional notes on the birds of Sind. *Str. Feath.* 5:322-330
- Butler, E.A. 1878. My last notes on the avifauna of Sind. *Str. Feath.* 7:173-191.
- Butler, E.A. 1879. Further additions to the Sindh avifauna. *Str. Feath.* 8:386-389.
- Christensen, G.C. 1963. Exotic game-bird introduction into Nevada. *Biol. Bull.* 3: 1-66. Nevada Fish and Game Commission, Reno.
- Christensen, G.C., Bohl, W.H., Bump, G. 1964. A study and review of the Common Indian Sandgrouse and the Imperial Sandgrouse. *Special Sci. Rep. - Wildlife* No. 84:1-71. United States. Department of Interior, Fish and Wildlife Service, Washington.
- D.C. Cloudsley-Thomson, J.L. 1979. *Terrestrial Environments*. London.
- Dali, N.K. and Ghosh, R.C. 1980. Tree plating and environmental Conservation. Extension series 6, Forest Research Institute and Colleges. Dehradun.
- Darlington, P.J. 1957. *Zoogeography: The geographical distribution of animals*. New York.
- Dharmakumarsinhji, K.S. 1954. *Birds of Saurashtra, India*. Times of India Press. Bombay.
- Dharmakumarsinhji, K.S. 1954. Goshawk (*Astur gentilis*) in Bhavnagar (Saurashtra). *J. Bombay nat. Hist. Soc.* 52: 211.
- Dharmakumarsinhji, K.S. 1956. Besra Sparrow Hawk (*Accipiter virgaetus*) in Saurashtra. *J. Bombay nat. Hist. Soc.* 53:699-701.
- Dharmakumarsinhji, K.S. 1958. Bluetailed Bee-eater *Merops philippinus* Linnaeus in western Saurashtra. *J. Bombay nat. Hist. Soc.* 55:351-352
- Dharmakumarsinhji, K.S. 1961. Occurrence of the Shelduck [*Tadorna tadorna* (Linn.)] in

Bhavnagar, Gujarat State. *J. Bombay nat. Hist. Soc.* 58:272-276.

Dharmakumarsinhji, K.S. 1963. The Forest Wagtail, *Motacilla Indica* Gmelin in the Gir forest, Saurashtra. *J. Bombay nat. Hist. Soc.* 60:261.

Dharmakumarsinhji, K.S. 1965. Two additions to the birds of Saurashtra, *Pavo* 3:72.

Dharmakumarsinhji, K.S. 1968. Occurrence of the House Swift *Delichon urbica* (Linn.) in Saurashtra, Gujarat. *J. Bombay nat. Hist. Soc.* 65:221-222.

Donald, C.H. 1917. The raptores of the Punjab. *J. Bombay nat. Hist.* 25: 231-248

Donald, C.M. 1919-1920. The birds of prey of the Punjab. *J. Bombay nat. Hist. Soc.* 26:629-655, 826-835, 1000-1020; 27:128-140, 280-300, 606-615

Foster, R.T. 1923. The Corvidae of the Punjab. *J. Bombay nat. Hist. Soc.* 29:841.

Himmatsinhji, M.K. 1960. The Eastern Calandra Lark (*Melanocorypha bimaculata*) in Kutch. *J. Bombay nat. Hist. Soc.* 57: 408.

Himmatsinhji, M.K. 1963. Occurrence of the Blackheaded Cuckoo-Shrike [*Coracina melanoptera* (Ruppell)] in Kutch. *J. Bombay nat. Hist.* 60: 735

Himmatsinhji, M.K. 1964. Additions to the birds of Kutch, *Monarcha azurea* (Bodd.) and *Muscicapa thalassina* Swainson. *J. Bombay nat. Hist. Soc.* 61:449-450.

Himmatsinhji, M.K. 1968. The brown Flycatcher, *Muscicapa latirostris* Raffles in Kutch. *J. Bombay nat. Hist. Soc.* 65:778-779.

Himmatsinhji, M.K. 1969. Large Cuckoo-Shrike and Blackheaded Oriole in Kutch. *J. Bombay nat. Hist. Soc.* 66:376.

Himmatsinhji, M.K. 1970. Greyheaded Myna *Sturnus malabaricus* (Gmelin) in Kutch. *J. Bombay nat. Hist. Soc.* 67: 332-333.

Homes, D.A. and Wright, J.O. 1968-1969. The birds of Sind. A review. *J. Bombay nat. Hist. Soc.* 65:533-556.

Hume, A.O. 1872. Contributions to the ornithology of India, Sindh. *Str. Feath.* 1:44-49.

Hume, A.O. 1878. The birds of a drought. *Str. Feath.* 7:52-68.

Krishnan, M.S. 1952. Geological History of Rajasthan. *Proc. Symp. Rajasthan Desert* (Nat. Inst. Sci. India). New Delhi. 27-29.

Lavkumar, K.S. 1958. The Eastern Swift, *Micropus apus* in Saurashtra. *J. Bombay nat Hist. Soc.* 55:352-353.

Madansinhji, M. 1949. Bird notes from Kutch. *J. Bombay nat. Hist. Soc.* 48:373-374.

- Mathur, D.S. 1969. New records of birds from Gir Forest. *J. Bombay nat. Hist. Soc.* 66:378-379.
- Mukherjee, A.K. 1963. An analysis of the food of the Grey Quail in Western Rajasthan (India). *Pavo*. 1:31-34.
- Newnham, A. 1900. Uncommon birds in Rajputana. *J. Bombay nat Hist. Soc.* 13:193-194.
- Oldham, C.F. 1883. The Saraswati and the 'lost' river of the Indian desert. *J. Asiat. Soc. Beng.* (NS) 25. 49-76.
- Oldham, R.D. 1886. On probable changes in the geography of the Punjab and its rivers. A historico-geographical study in Ecology and Biogeography in India, Ed. M.S. Mani(1974) pp.1-59.
- Prakash, I. and P.K. 1963. The Great Indian Bustard in Rajasthan Desert. Newsletter Ghosh, for Bird-watchers. 3:1.
- Prakash, I. and Ghosh, P.K. 1964. The Great Indian Bustard breeding in Rajasthan Desert. Newsletter for Bird-watchers. 4:1.
- Prakash, I., Kumbakarni, C.G. and Krishnan, A 1965. Eco-toxicology and control of the Indian desert Gerbille, *Meriones hurrianae* Jerdon Pt. III. Burrow temperature. *J. Bombay nat. Hist. Soc.* 61:237-244.
- Prakash, I. 1974. The ecology of vertebrates of the Indian Deseert. Ecology and biogeography of India. Dr. W. Junk b.v. publishers. The Hague.
- Prakash, I. 1975. The ecology and geography of mammals. In environmental analysis of the Thar Desert. *Dehradun*.
- Pramanick, S.K. and Hariharan, P.S. 1952. The Climate of Rajasthan. *Proc. Symp. Rajasthan Desert. Bull nat. Inst. Sci. India.* 1:167-178.
- Roonwal, M.L. 1982. Fauna of the Great Indian Desert. Desert Resources and Technology. 1 : 1-86.
- Schokalskaya, Z.J. 1932. Contributions to the knowledge of soils of Asia. Leningrad.
- Sen, N.N. and Sankhala, K.S. 1962. Wild Life of Rajasthan; A study in Ecology. *Proc. Ist All-India Congr. Zool.* (Jabalpur 1959): 258-268.
- Sewell, R.B.S. 1951. Oceanographic Work in India. *Sci. Cult.*, Calcutta
- Sharma, I.K. 1965. Some observations on Peafowl at Jodhpur. *Peacock*. 2:26-34.
- Sharma, I.K. 1969. Habitat et Comportment due Paon (*Pavo cristatus*). *Alauda*. 37:219 - 223.
- Sharma, S.C. 1965. Winter food of the Painted Partridge, *Francolinus pictus* (Jardine and Selby) in Rajasthan. *J. Bombay nat. Hist. Soc.* 61:686-688.
- Shekar, P.B. 1960. Further additions to the birds of Kutch. *J. Bombay nat. Hist. Soc.* 57:224-225.

- Shivraj Kumar, Y.S. 1954. Occurrence of the Crested Bunting (*Melophus lathamii*) in Saurashtra. *J. Bombay nat. Hist. Soc.* 52:130.
- Shivraj Kumar, Y.S. 1955. Occurrence of the Whitewinged Black Tern (*Chidonias leucopterus* Temm.) in Saurashtra. *J. Bombay nat. Hist. Soc.* 53:130.
- Shivraj Kumar, Y.S. 1961. The Moustached sedge Warbler (*Luscinicola melanopogon* (Temminck)) and the Yellow Bittern [*Ixobrychus sinensis* (Gmelin)] additions to the birds of Kutch. *J. Bombay nat. Hist. Soc.* 58:513.
- Shivraj Kumar, Y.S. 1962. Occurrence of the Whitecapped Bunting *Emberiza stewarti* (Blyth) in Gujarat. *J. Bombay nat. Hist. Soc.* 59:956-957.
- Shivraj Kumar, Y.S. 1969. Blackcrowned Finch-lark *Eremopterix nigriceps affinis* (Blyth) in Gujarat. *J. Bombay nat. Hist. Soc.* 66:62.
- Shivraj Kumar, Y.S. 1971. Occurrence of the Barheaded Goose *Anser indicus* in Jasdan (Gujarat). *J. Bombay nat. Hist. Soc.* 68:242.
- Sinha, Y.P. 1982. The bats of Rajasthan: Taxonomy and zoogeography. *Rec. zool. Surv. India.* 76:7-63.
- Stoliczka, F. 1872. Notice of the mammals and birds inhabiting Kachh. *J. Asiat. Soc. Beng.* 41 : 211-258.
- Ticehurst, C.B. 1922. The birds of Sind. *The Ibis.* 4: (part 1&2): 526-572, 605-662.
- Ticehurst, C.B. 1923. The birds of Sind. *The Ibis,* 5:(parts 3, 4, 5, 6): 1-43, 235-275, 438-474, 645-666.
- Ticehurst, C.B. 1924. The birds of Sind. *The Ibis* 6:(parts 7 & 8):110-146, 495-518.
- Vardhan, H. 1980. How many bustards? *Cheetal, Dehra Dun* 21 (4):13.
- Vaurie, C. and Dharmakumarsinhji, K.S. 1954. A new Sandlark from western India (Saurashtra) *J. Bombay nat. Hist. Soc.* 52:8-9.
- Waite, H.W. 1937. Some interesting records of birds from Punjab. *J. Bombay nat. Hist. Soc.* 39:861-862.
- Whistler, H. 1915. Some birds in Hissar District, Punjab. *J. Bombay nat. Hist. Soc.* 24:190-191.
- Whistler, H. 1923. A note on Corvidae of the Punjab. *J. Bombay nat. Hist. Soc.* 40:213-235.
- Whistler, H. 1924-1925. A note on the weavers and finches of the Punjab. *J. Bombay nat. Hist. Soc.* 30: 177-178, 406-417.
- Whistler, H. 1938. The Ornithological Survey of Jodhpur States. *J. Bombay nat. Hist. Soc.* 40 : 213-235.
- Voous, K.H. 1960. Atlas of European birds. London (Nelson).

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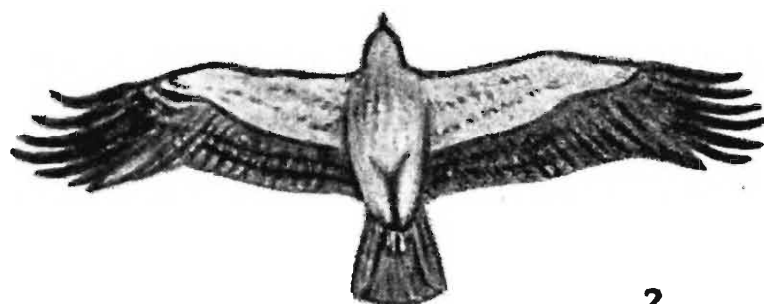


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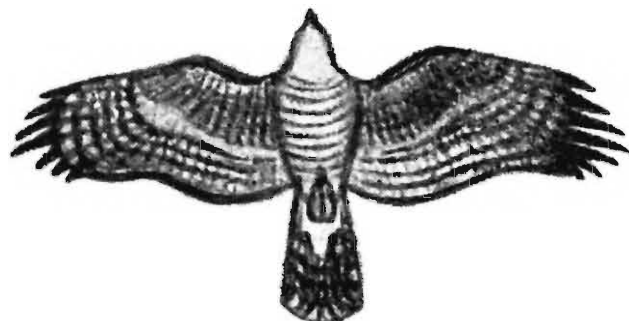
PLATE I



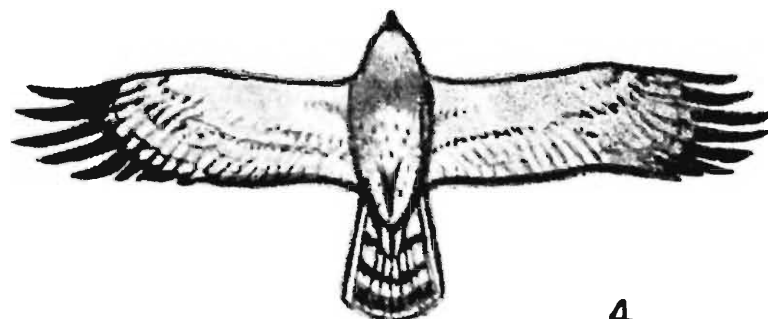
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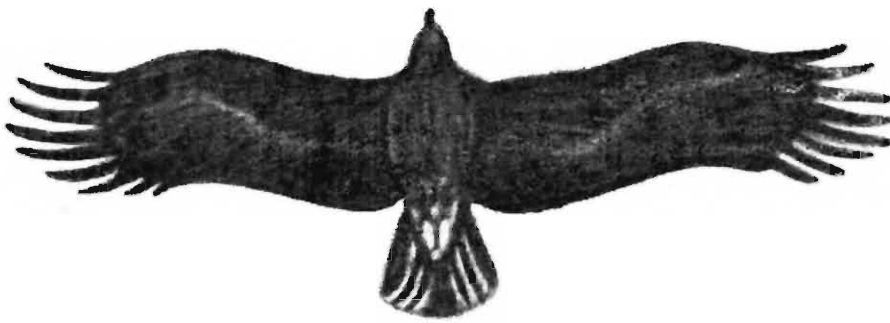


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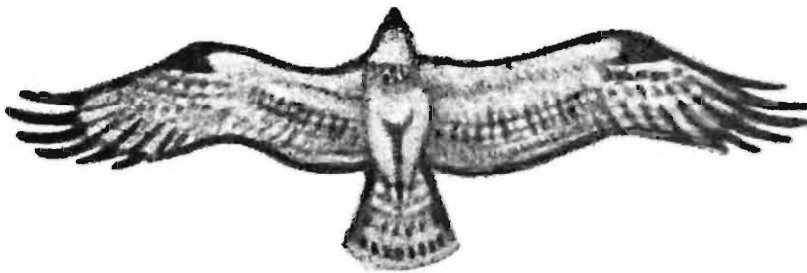
- Fig. 1. Booted Hawk-Eagle (adult). Dark phase.
Fig. 2. Booted Hawk-Eagle (adult). Dark phase.
Fig. 3. Goshawk.
Fig. 4. Short-toed Eagle (adult).

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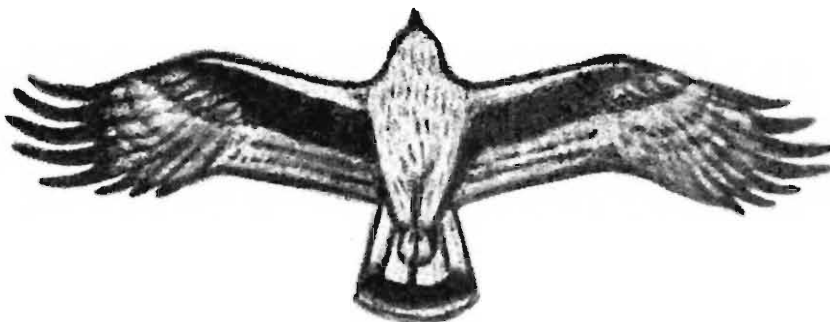
PLATE II



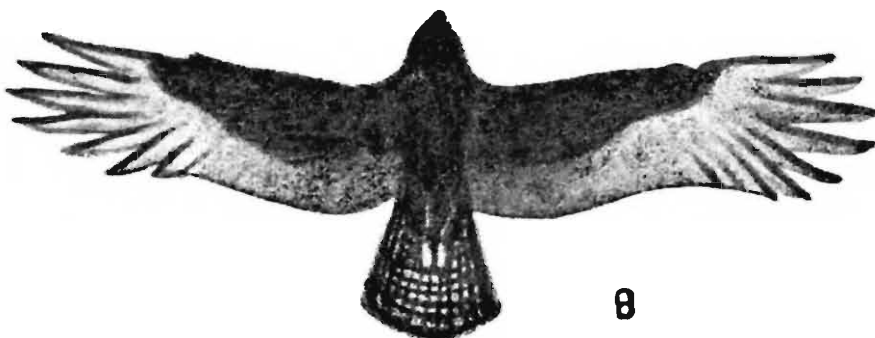
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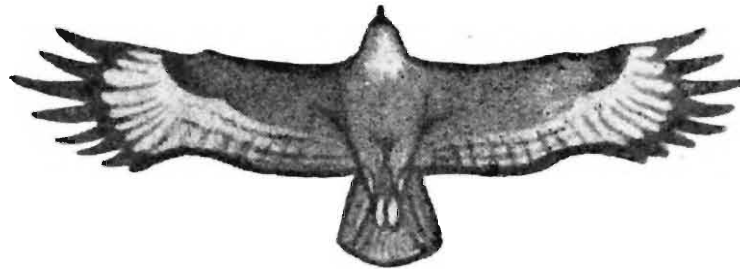
- Fig. 5. Great Spotted Eagle.
Fig. 6. Osprey.
Fig. 7. Bonelli's Hawk-Eagle (adult).
Fig. 8. Tawny Eagle (adult, normal).

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PLATE III



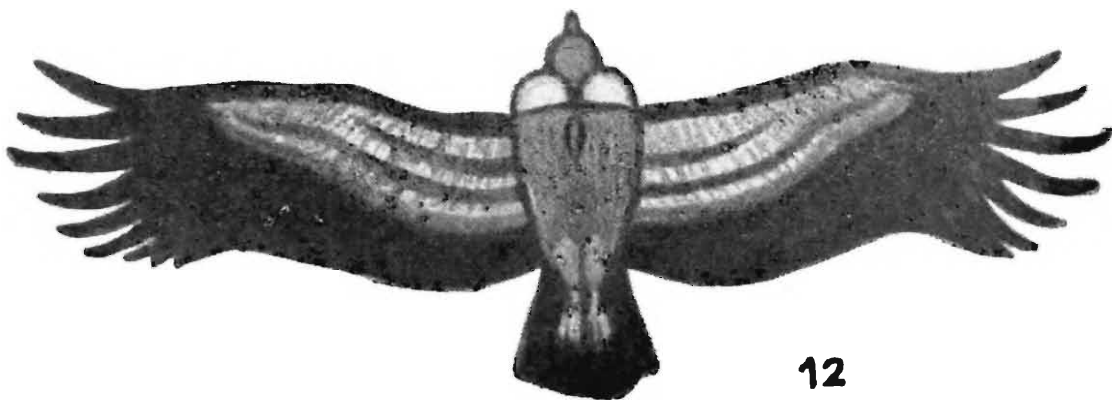
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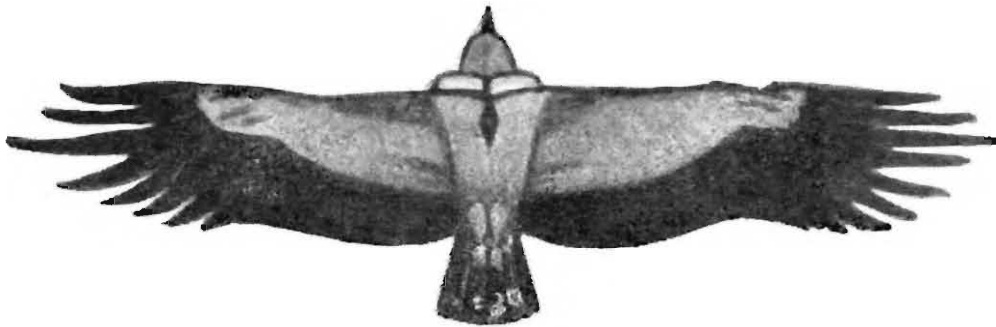


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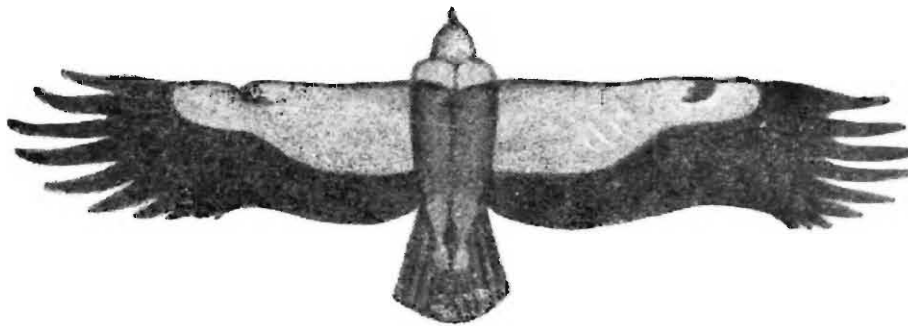
- Fig. 9. Tawny Eagle (adult pale).
Fig. 10. Longlegged Buzzard.
Fig. 11. Black Vulture.
Fig. 12. Griffon Vulture.

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PLATE IV



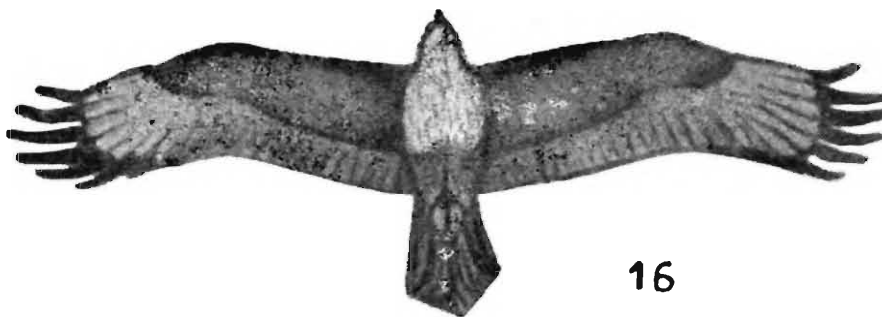
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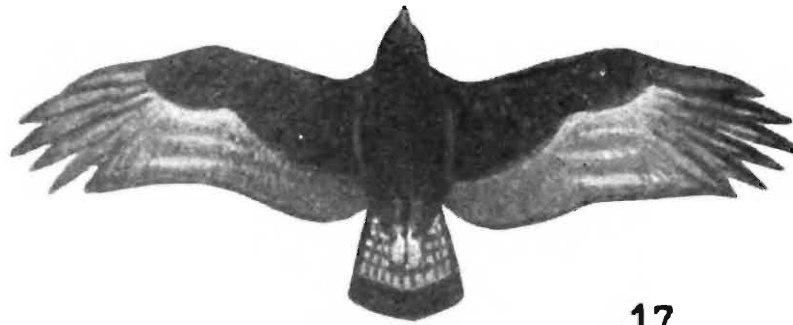


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- Fig. 13. Imperial Eagle (adult).
Fig. 14. Whitetailed Sea Eagle.
Fig. 15. Pallas's Sea Eagle.
Fig. 16. Longbilled Vulture.

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PLATE V



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Fig. 17. Whitebilled Vulture.
Fig. 18. King Vulture.
Fig. 19. Brahmini Kite.

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PLATE VI



Fig. 20. Common Bustard-Quail.

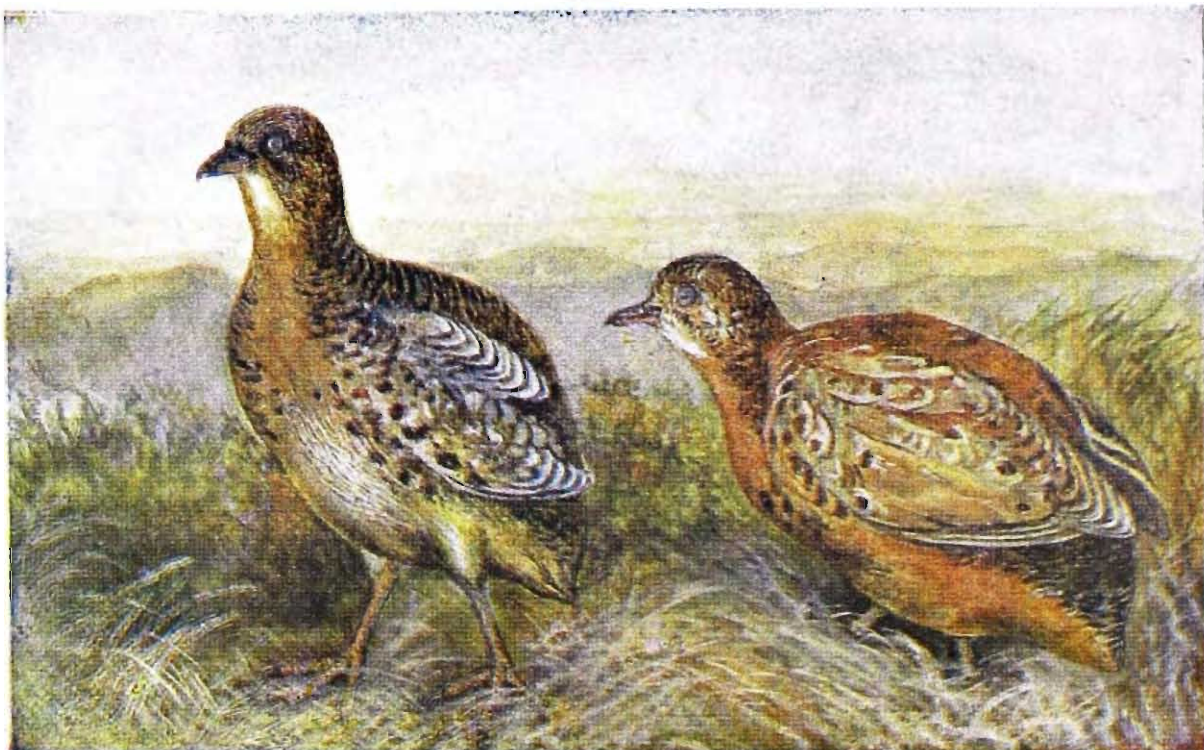


Fig. 21. Indian Yellowlegged Button Quail.

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PLATE VII

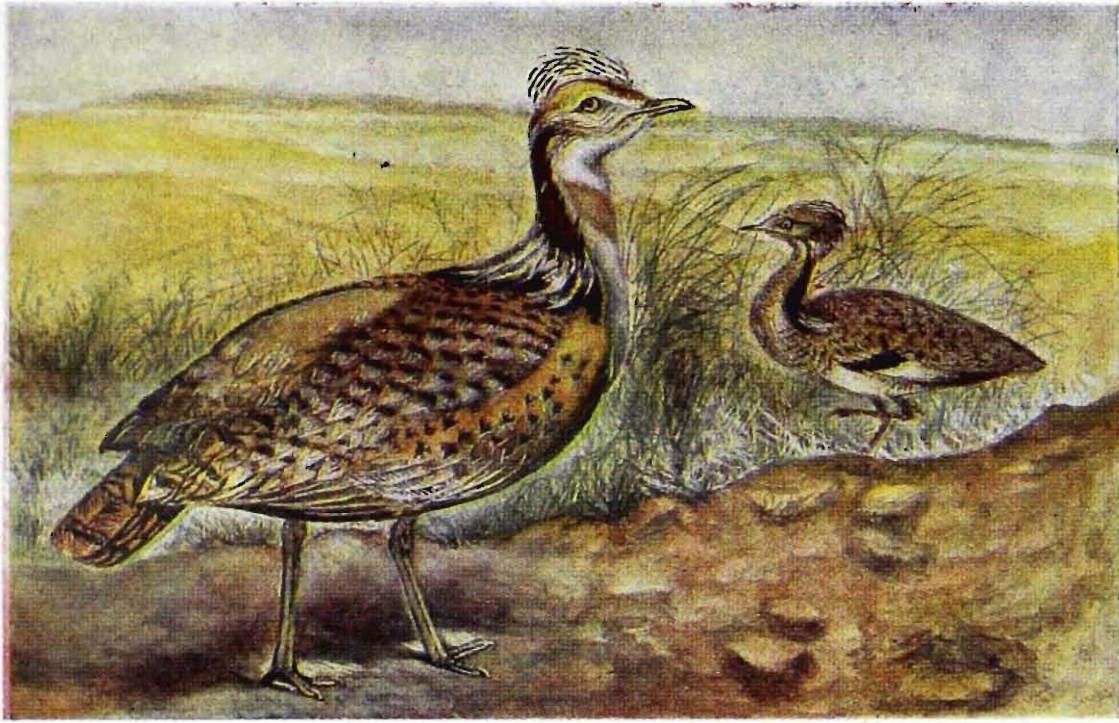


Fig. 22. Houbara.



Fig. 23. Likh or Lesser Florican.

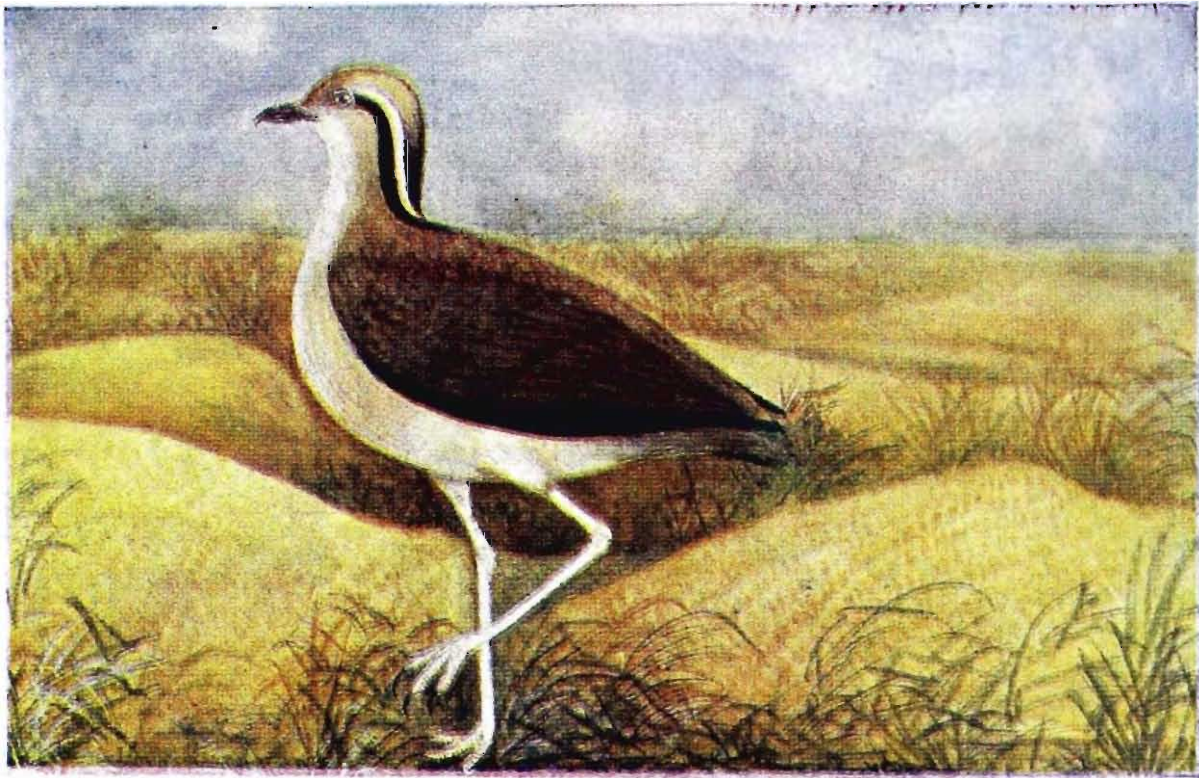


Fig. 24. Desert or Creamcoloured Courser.



Fig. 25. Large Pintail Sandgrouse.

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PLATE IX

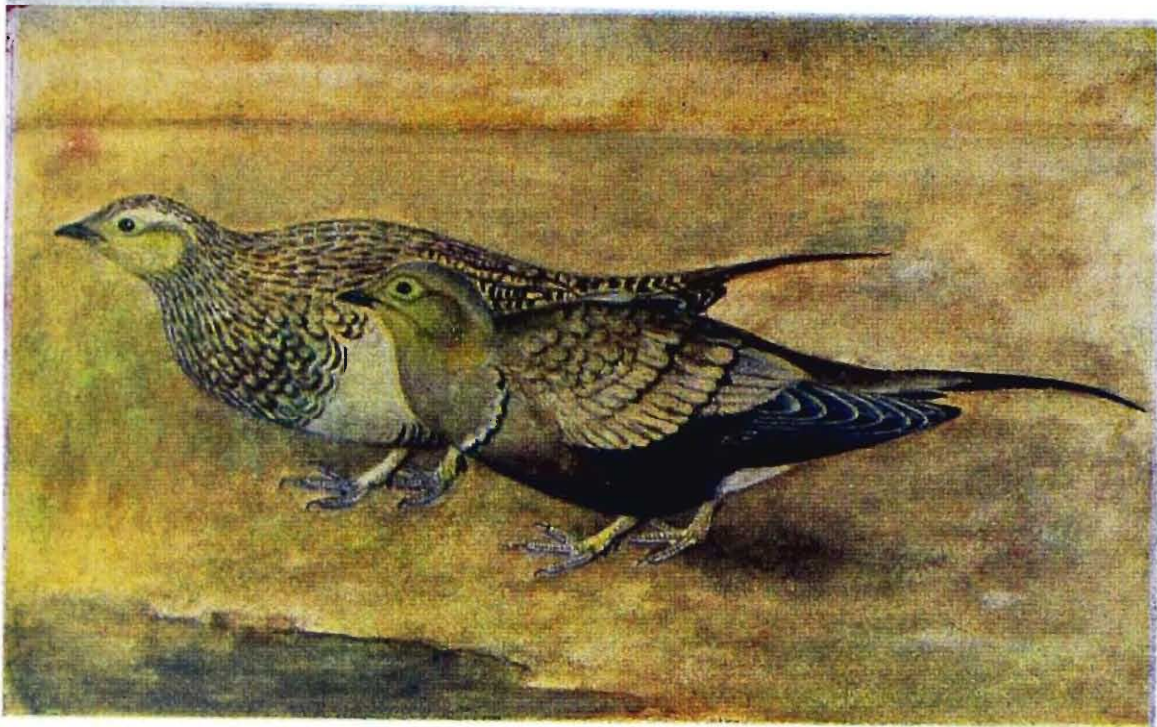


Fig. 26. Indian Sandgrouse.



Fig. 27. Spotted Sandgrouse.



Fig. 28. Imperial Sandgrouse.



Fig. 29. Painted Sandgrouse.

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PLATE XI



Fig. 30. Great Horned Owl.



Fig. 31. Indian Crested Lark.

Fig. 32. Pied Chat.

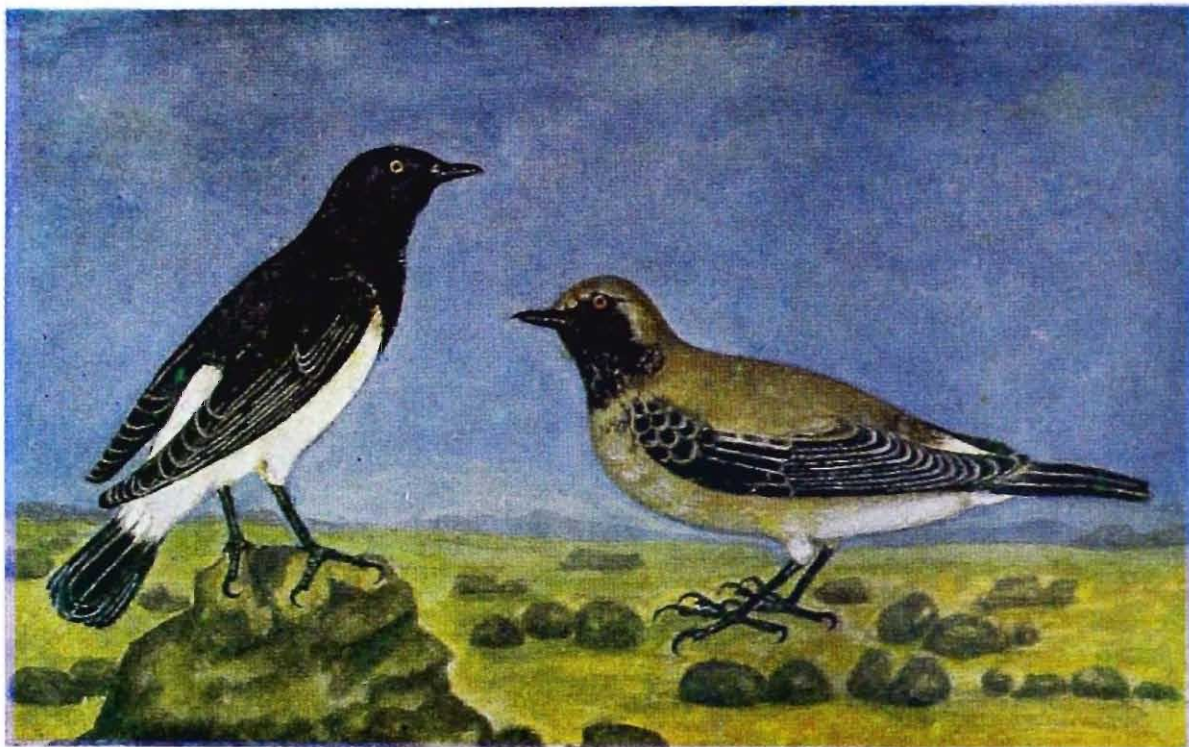


Fig. 33. Brown Rock Chat.
Fig, 34. Desert Wheatear,



35. Barn Owl, *Tyto alln.*



Fig. 36. Ruff and Reeve
Philomachus pugnax



Fig. 37. The Cormorant at a lake in Jaisalmer, Western
Rajasthan.

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PLATE XIV

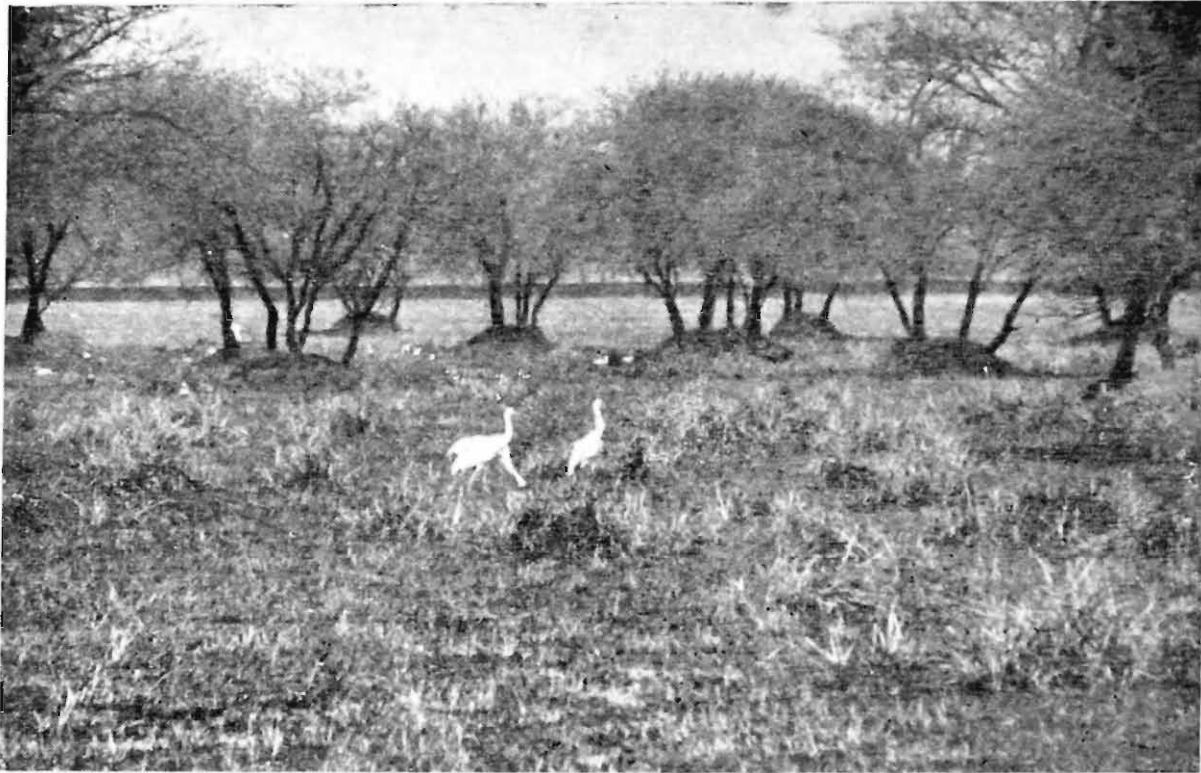


Fig. 38. The Siberian Crane at Keoladeo Ghana, Bharatpur, Northeastern Rajasthan,

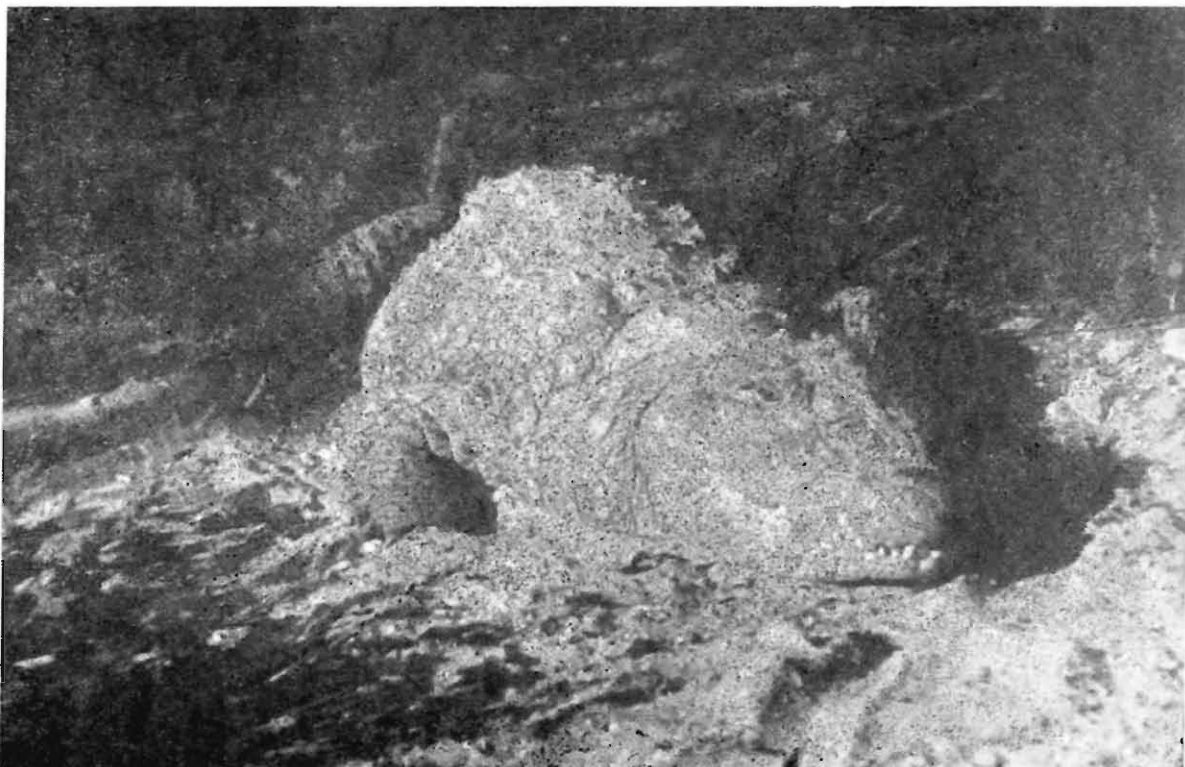


Fig. 39 Marsh Crocodile at Gir National Park (breeding centre),