

# THE CAMBRIDGE ORNITHOLOGICAL EXPEDITION TO THE HIMALAYAS 1973

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## PATRONS

C.W.BENSON,OBE. (Department of Zoology, University of Cambridge). Sir HUGH ELLIOT, Bt. (Vice-President, British Ornithologists Union). G.R.MOUNTFORT,OBE. (President, British Ornithologists Union). Dr. B.ROBERTS. (Scott Polar Institute, University of Cambridge).

#### EXPEDITION MEMBERS

M.A.S.BEAMAN,	(Churchill College, Cambridge). (Leader),
J.E.BRUCE.	(Churchill College, Cambridge).
D.K.BOND.	(University College, London).
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G.E.DOBBS.	(Van Mildert College, Durham).
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#### GENERAL REPORT

Since we only conceived the idea of this expedition at the beginning of 1973 this had a profound effect on the organization of the project. In particular opportunities for raising funds were restricted and the time available for applications similarly limited. Preparations generally had to procede very rapidly and the burden fell almost entirely on the two members of the expedition party living in Cambridge (Mark Beaman and John Bruce) since the delays in communication with the other members of the party would have caused chaos. Administrative costs were higher than they would otherwise have been since expedition work had to be fitted in between preparations for examinations; photocopying replaced cheaper methods of duplicating and telephone calls, telegrams and even personal visits replaced letters.

We thought initially that a lack of time might cause difficulties in arranging official sanction for our study from the Nepalese authorities (in this case the Foreign Ministry and the Ministry of Forests). Communication between Cambridge and Kathmandu was, to put it mildly, a little slow and in the end it proved more practicable to visit Nepal on standard two week tourist visas and then to apply for visa extensions and trekking permits.

We decided to travel out overland by public transport (principally for the sake of economy and also because we would have had to drive a vehicle back again instead of returning by air). In the end five of us travelled out by this means and John Dick joined us in Delhi, having flown out to Bombay in late July. Since we had to carry our belongings and equipment with us, there was a premium on cutting out inessentials. We took all our personal effects, camping gear and scientific equipment with us, chosing to buy our food in Nepal, and this arrangement proved quite satisfactory - each person having to cope with a kit-bag in addition to his own rucksack.

Leaving Cambridge on July 4th we travelled by train to Istanbul and then by 'bus eastwards to Teheran, Kabul and Peshawar. From here we relied mostly on the railways (except when travelling to and from Kashmir and on the final stage to Kathmandu, when we reverted to 'buses), arriving in Kathmandu on August 21st. Travelling overland was aesthetically very rewarding, but hard on the flesh! By the time we arrived in Nepal we had all lost a lot of weight and become hardened to the inevitable dysentery. We were fortunate not to have been greatly delayed en route, for we arrived in Kabul on the day of the coup d'etat and left Srinagar (Kashmir) the day before the only road out was blocked for two weeks by subsidence and flooding. If we had been really hurried it might have been possible to reach Kathmandu three weeks after leaving Britain, but only at the risk of complete exhaustion and a nervous breakdown.

It was a relief to escape from the sticky monsoon heat and torrential monsoon rain of the Indian plains, but we had only a short time to relax in the comparative peace and quiet of Kathmandu. By the 27th August we had arranged for trekking permits and visa extensions for the party. In this matter the British Embassy was very helpful - putting us in touch with one of the leading trekking tour operators, Mountain Travel, who were able to smooth the path for our applications and who also supplied us with a Sherpa liason officer and a Land Rover to transport our supplies to Pokhara. Geoff Dobbs, Mike Hodgson and our Sherpa, Pasang Pemba, went on to Pokhara in advance to arrange the hire of porters whilst the rest of us remained in Kathmandu for two more days to add the finishing touches to the mountain of stores accumulating at our hotel. On the 29th August we filled a long wheel-base Land Rover with our equipment (and ourselves) and drove to Pokhara, which we reached in the late afternoon. We found our twenty porters, Gurung tribesmen from Midland Nepal, already waiting and we spent the evening haggling over the size of individual loads and the amount of advance pay.

Next morning we awoke to find the great curtain of cloud which had covered the great Himalayan peaks since our arrival in Nepal shrunk to a few small relicts and the whole Annapurna massif stretched out in front of us from horizon to horizon. In the foreground the great spire of Machhapuchhre (22,942') completely dominated the scene, the rich greens of the tropical forests on the lower hills contrasting with the sparkling ice-walls and snowfields far above. We decided that it was a good omen and made ready for departure.

We trekked across the mountains for six days (and in the event it only rained at night), reaching our base camp in the Kali Gandaki valley (at 8200') on the 4th September. The trek was most rewarding from both a biological and an aesthetic viewpoint. It served the purpose of introducing the party to the very diverse local avifauna and flora in this part of the Himalayas, so that work in the valley was not hampered initially by a morass of unidentifiable birds etc. In addition the dramatic contrast as one left the monsoon paddyfields around Pokhara (c2600') and climbed through the sub-tropical broad-leaf forests up to the pine and rhodedendron cloud forests at Ghorapani (c9300') was very striking. Beyond Ghorapani lay the Kali Gandaki valley - at last. We had almost left the Hindu world by this time and were proceeding into the Tibetan Bhuddist world of the high valleys. Thatched huts gave way to flat-roofed stone houses, often grouped in semifortified villages, water buffalos gave way to ponies, cattle and dzos (crosses between cattle and yaks). As we passed into the rain-shadow north of the main range the forests became almost 'Alpine' in character - composed of Blue Pine, Silver Fir, Yew, Juniper and some Spruce at higher altitudes (>10,000').

We had very little trouble on the trail - losing only two porters, who ran away in the night just before the worst climb of the trek! Fortunately these were quickly replaced and so we were not unduly delayed. Even the leeches, particularly common in the rhodedendron cloud forests above 7500', were less of a menace than we expected. Nevertheless, we all suffered from their attacks. Along the trail we were able to obtain simple accomodation in Thakali households. Many of these people leave Thak Khola (the upper Kali Gandaki valley between Dana and Jomsom) during the so-called'trekking season' in order to open small hostelries along the more popular trails. Shops were almost non-existent however, with the exception of a remarkable one at Tatopani - which even sold several kinds of chocolate and iced drinks!

After reaching our base camp area, just north of Kalopani, we set up camp in a deserted house on the east bank of the river. At this point the valley opens up after one emerges from the deep gorges north of Dana and the river meanders across broad gravel flats. The house was situated on a grassy terrace next to the river, hemmed in on three sides by steep, forested slopes. Although the forest was mostly of the 'Alpine' type described previously, deciduous broad-leaf trees and shrubs abounded in gulleys and on the edges of the valley. Just north of the camp we found a large area of Buckthorn (Hippophae tibetana) scrub growing on the gravel flats. This unique area proved the most rewarding when searches for migrants took place - its attractiveness to a wide variety of bird species was enhanced by the small pools amongst the bushes and the rich crop of ripening berries.

The weather was very changeable, but considering that the monsoon ended much later than normal, reasonably good. The strong catabatic wind which blows up the valley had a strong hand in this - clearing the cloud away from the centre of the valley so that one could look up and see a blue strip of sky, flanked by walls of cloud on either side, extending far to the north. The resulting sharp fall in rainfall is responsible for the transition to a Tibet man-steppe flora over the few miles between our camp and Jomson, where the valley floor is almost devoid of vegetation - just a few potato fields max, some stunted bushes of Caragana and low herbage.

During our 6 weeks in the valley we climbed to the base of the Dhaulagiri ice-fall (15,500') as part of a survey of the local avifauna. Between 10-11,000' the 'Alpine' forest gave way to Rhodedendrons, Juniper and Birch, with only a little Birch scrub above 11,000'. Beyond 11,500' only low cushion scrub and grasses remained - forming the rich high-altitude 'Yak Pastures' much used by the local pastoralists. These pastures extend up to 17,000' in places, but are deserted from October onwards when the snow descends below 12-13,000'.

The two remaining members of the party (Mark Beaman and John Dick) moved to Jomsom in early October and eventually flew back to Kathmandu by STOL aircraft. However, since the plane bogged down in the runway up to its axles on landing, it took the whole of Jomsom to dig it out before they finally got away.

By mid-November we were all back in Britain, trying to adjust to soft beds and good food!

#### HEALTH

We were fortunate in having John Dick (who recently qualified at Guy's Hospital,London) as medical officer for the party and so avoided having to cope with strange symptoms by a 'try it and see' policy! By far the commonest complaint was bacterial dysentery, afflicting all of us for weeks on end. Maintaining adequate hygeine on the journey overland was impossible as we were reliant on the small restaurants we found en route. In the valley, when we were mostly eating processed Indian canned foods, dysentery became a rare complaint. Fortunately no one caught amoebic dysentery and we had little trouble after our return to the U.K.

Minor complaints included indigestion, mild sun-burn, styes, minor cuts and abrasions, sore throats, constipation (for a change!) and unidentified 'flu-like illnesses. One of us suffered from an abcessed tooth, but luckily we were in Delhi at the time. David Bond was the hardest hit, having a painful megraine and respiratory complaint in Kashmir and then falling and fracturing his skull whilst walking back to Pokhara at the end of the expedition. Luckily the side-effects of the fracture did not incapacitate him and he was able to continue to Britain without harm.

#### ACKNOWLEDGEMENTS

We should like to express our grateful thanks to all the following (and anyone we may have inadvertently left out) for their part in making the expedition possible:- Dr.Salim Ali,

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(Organizations marked with an asterisk made grants to the expedition or to individual members of the party).

## ACCOUNTS

DEBIT	
Travel (to Nepal, 5 overland, 1 by air to India).	£305
Travel (Nepal-UK, by air India-UK).	£590
Food and accomodation etc. en route.	£265
Food and accomodation etc. in Nepal (excl. time in field).	£ 60
Food, stores, misc. for expedition in the field.	£249
Porters, Sherpa, vehicle hire etc.	£172
Transport of luggage etc.	£ 66
Books, papers, maps.	£ 74
Ringing equipment.	£137
Fees, charges, permits.	£ 74
Medical kit.	£ 30
Other equipment.	£ 29
Donation.	£ 10
Stationary etc.	£ 25
Postage, telegrams, telephone.	£ 57
Administrative expenses (prospectus, reports, travel, expenses)	£286(estimate)
	£2429

### CREDIT

Grants to	the expediti	on				€ 820
Personal	contributions	(including	grants	to	individuals)	£1609
						£2429

#### SCIENTIFI REPORT

#### INTRODUCTION

Each automn vast numbers of birds from the Palaearctic region migrate south to wither in the more congenial regions of Africa south of the Sahara, South-East Asia and the Indian sub-continent. The numbers of birds involved is uncertain, but it may exceed 8,000 million (Moreau 1972). On this journey south, which normally requires a flight of between 1,500 and 6,000 miles, the great majority of migrants have to cross large areas which are ecologically very inhospitable.

For those populations wintering in Africa the obstacles posed by the Mediterranean and the deserts of Central Asia are followed by the almost continuous barrier of the Saharan and Arabian Deserts, over 1,000 miles wide and stretching from the Atlantic to the Indian Ocean - an area in which food, water and shade is virtually unobtainable. Nevertheless, great numbers of birds cross these barriers successfully and migration studies in the area indicate that most do so in a single, unbroken flight. They acheive this capability by storing up supplies of lipids (high-energy fats) in the pre-migration period - in some cases almost doubling in weight. A similar sequence of events occurs on the return migration in spring.

Further east the situation has been much less studied. Certainly birds from the Eastern Palaearctic (approximately east of 90°E) wintering in South-East Asia have a far less strenuous journey than that faced by those originating in the rest of the Palaearctic, for the deserts and mountain ranges interposed in between are of comparatively limited extent. However, from Afghanistan to the borders of China the 200 to 800 miles crossing of the Tibetan Plateau and its associated ranges presents a formidable barrier - isolating the Indian sub-continent from the Palaearctic. In spite of this some 350 or more species and sub-species of Palaearctic origin winter to some extent in the sub-continent - including many small Passerine species. These migrants spread out across Northern India\* in September-November, some penetrating as far south as the peninsula and Ceylon, returning northwards in March and April.

Surprisingly little is known of the routes which these migrants take when entering and leaving the sub-continent. Practically all the existing information consists of the rather scrappy,often haphazard observations of colonial service personnel along the borders of the Indian Empire (particularly along the Indo-Afghan border). Although most of these observers concentrated on game birds, their records indicate the importance of the Indus Valley in the north-west and the Brahmaputra or Tsangpo valley in the north-east as flyways for birds entering India. More recently the idea that most migrants'leak' around the Tibetan Plateau has been developed by Moreau (The Palaearctic-African Bird Migration Systems, 1972) and Salim Ali & Ripley (Handbook of the Birds of India & Pakistan, 1968-74). Moreau goes so far as to state that'there is a continuing absence of evidence that any migrant species breeding in Siberia regularly crosses over the high, elevated and ecologically inimical Tibetan Plateau, flanked by the gigantic Himalayas'. However, both Salim Ali & Ripley and Vaurie (Tibet and its Birds, 1972) refer to the increasing number of observations of Palaearctic migrants (some of Siberian origin) resulting from the activities of mountaineering expeditions in the Himalayas, quoting records of geese, ducks, waders, raptors and even small Passerines in the high passes at heights of up to 29,500 feet.

Regardless of these scanty observations, however, the long-term influence which the Tibetan Plateau has had on the pattern of bird migration in the region has been clearly shown by Moreau's analysis of the number of migrants from each region of the Palaearctic which winter in tropical Africa. Some 137 species from the Western Palaearctic (west of 45°E ) winter exclusively in Africa south of the Sahara and 10 in India, but 82 species from the Mid Palaearctic (45-90°E) winter in Africa compared to only about 50 in India, although the sub-continent is considerably closer. Only 14 species from the Eastern Palaearctic winter in Africa, the majority wintering in South-East Asia. Clearly one would expect a rather larger proportion of migrants from the Mid Palaearctic to winter in India and in this context it is of great interest that the bulk of species wintering in Africa are small Passerines (especially warblers) - most raptors, waterbirds and other non-Passerines wintering in the sub-continent. At first sight this seems rather contradictory, the birds of more powerful flight making the shortest journey, but if one proposes that the Tibetan Plateau is an almost impassable barrier for small Passerines the difficulty is resolved.

#### Table 1.

The numbers of species migrating to Africa from different regions of the Palaearctic. (N.B. The total number of species originating in each region wintering in the tropics is approximately equivalent).

	W.Palaearctic	Mid Palaearctic	E.Palaearct
Warblers	26	20	2
Other Passerines	36	32	6
Raptors	19	5	3
Water-birds	35	. 12	1
Other non-Passerines	21	13	2

Intrigued by this uncertainty, which is mostly due to the lack of systematic observations in the Himalayas during the migration periods, the idea of an expedition to attempt to shed some light on these problems was conceived early in 1973. We chose the Kali Gandaki valley in West-Central Nepal as the site for the study for several reasons. Firstly, this part of Nepal is bounded to the north by almost the widest expanse of the Tibetan Plateau and is thus, superficially at least, at the far end of the most arduous potential crossing in the region. Secondly, the valley is unusual in that it penetrates right through the main range of the Himalayas, originating on the edge of the Tibetan Plateau itself, and so forms a natural route for migrants leaving the Plateau. Finally, as a consequence of the prevailing political difficulties in the area, it is one of the few valleys in which one can observe the complete transition from sub-tropical, monsoon lowlands to arid, sub-Tibetan uplands.



FIGURE.1. THE PALEARCTIC AND OLD WORLD TROPICAL REGIONS, indicating relief and desert regions. 80° 40° 0° 40° 80° 120° 160°

Key to Figure 1.

Areas of mean altitude exceeding 6000 feet. Areas of less than 4 inches mean annual rainfall.

1000 Kilometres (625 miles).



#### MIGRATION

Our original intention was to develop a ringing station in the upper Kali Gandaki valley south of Tukche (8485 feet above sea-level) and to carry out observations of visible migration from this site. A further aspect of the study would be a comparison of the avifauna of this area with a specified area in Kashmir (i.e. the Lidar valley). Lack of time precluded the latter aspect, but we nevertheless made observations of the local avifauna throughout our stay in the valley and on the various journeys to and from Pokhara (see 'Other Observations').

We arrived in the valley on the 1st September, arriving at our base camp, just north of Kalopani (8,000'), on the  $\frac{4}{2}$  th Palaearctic migrants observed had been a Greenshank at Phewa Tal, a Little Ringed Plover at Suikhet and a Buzzard at Lumle. However, within an hour of reaching our camp  $\frac{2}{4}$  Pallas's Sea Eagles and an Osprey had passed down the valley, events which raised our hopes of things to come. On the following day we established two netting sites - one in a copse of Sweet Chestnut trees (Aesculus) behind the camp and a second in a gulley choked with broad-leaf bushes just south of the camp. These two sites were the only available ones within valking distance of the camp - to the south were cultivated potato fields around Dhumpu and to the east and north steep, forested hill-sides covered in Blue Pine, Silver Fir, Yew and Juniper.

However, as an examination of the systematic list of migrants shows, Passerine migration was on a rather small scale, although the variety of species was quite considerable. After 9 days we suspended full-time ringing, subsequently restricting it to occasional efforts to catch particular migrants, since the effort involved did not justify the results. We were able to catch considerable numbers of local birds, in spite of much heavy rain (it was the end of the monsoon) and the strong catabatic wind, but only at the expense of diverting manpower from observations of visible migrants. A list of the birds ringed is shown in Table 1.

Although Passerines were relatively scarce, the migration of non-Passerines, if not spectacular, was certainly steady and conspicuous. Throughout September a constant procession of migrant raptors passed down the valley, Black Kites and Buzzards being the most conspicuous species, but 16 other species were also recorded. A few waders and ducks were also observed (some 200 Pintail being the peak count), but these were scarce until the residual party moved to Jomsom in early October. By this time the migration of waders should have been declining (although this would not be true of wildfowl (Anatidae)) and it seems that the small marsh at Jomsom had a large influence on the sudden increase in the records! It seems quite probable that many more waders and wildfowl would have been observed if the expedition had been based permanently at Jomsom. At our camp near Tukche the valley floor consisted of a large gravel sheet, somewhat unsuitable for these species. In retrospect it also seems probable that Passerine migrants would have been easier to locate in the sparse vegetation around Jomsom than in the comparatively rich woodlands further south.

By far the most impressive and moving sight, however, were the great skeins of cranes which passed southwards from late September onwards (Cranes and Demoiselle Cranes occurring in approximately equal numbers). On the peak date over 8,000 were observed and flocks of several hundred were a common sight in October. As with the wildfowl, it seems likely that their migration was still in full swing when we left the valley on October 14th.

The early date of our departure may have been the reason why we failed to observe a number of expected species (e.g. Red-throated and Black-throated Thrushes, which have been recorded on migration on the Tibetan Plateau (Koslov 1899)).

The possibility that many Passerines passed over at night and failed to halt in the high valleys seems excluded by the fact that there were no 'falls' following bad weather, although thunderstorms were not unusual at this season. However, we must have missed numbers of diurnal migrants since on several occasions we picked up birds which were barely visible to the naked eye (particularly cranes) and once cranes were seen passing over the summit of Nilgiri (23,166') when one of us was taking a telephoto picture of the summit ice-walls.

The presence of a number of Palaearctic species in the high Himalayas which also occur in Tibet or which have sub-species (indistinguishable in the field) occurring further north introduced an element of confusion into our observations. Thus we have here assumed that the records of Solitary Snipe,Cuckoo,Rufous Turtle Dove and Greenish Warbler all apply to locally breeding birds in the absence of evidence to the contrary, but Tickell's Warbler and Black Redstart have been included in the list of migrants since the periodic influxes suggested passage from Tibet or at least the Tibetansteppe facies of Northern Nepal (here considered as part of the Palaearctic for faunistic purposes).

Presentation of the data is further complicated by the confusion in the nomenclature - there being significant differences between the two standard works concerned (Vaurie's Birds of the Palaearctic Fauna 1959-65 and Salim Ali & Ripley). Vaurie's nomenclature and vernacular names are followed here. FIGURE 3. THE UPPER KALI GANDAKI VALLEY.



#### SYSTEMATIC LIST OF MIGRANTS

CORMORANT Phalacrocorax carbo sinensis. Europe east to E.Siberia and Japan, including Central Asia,? South Tibet, India and South-East Asia. A single

at Jomsom on the 14th October.

MALLARD Anas platyrhynchos platyrhynchos. Throughout the Palaearctic south to South Tibet and Kashmir. 2 on 13th September,1 on the 15th,4 on the 21st, 1 on the 25rd and 1 on the 25th.

GREEN-WINGED TEAL Anas crecca crecca. Europe,South-West Asia and Siberia. Singles on 26th September,7th October,6 at Jomsom on 9th October,13 on the 10th also at Jomsom.

PINTAIL Anas acuta acuta. Temperate and sub-arctic Holarctic, sporadically further south. 201 at Jomsom on the 9th October, 4 on the 10th, 7-8 on the 14th. 1 on the 3<sup>no</sup> October near Beni.

GARGANEY Anas querquedula. Europe, South-West Asia, Siberia - sporadically further south. 2 on 25th September, 4 on the 26th, 14 on the 28th, 3 on the 9th October at Jomsom, where 3 on the 10th also. 26 on the 3<sup>rd</sup> October near Beni.

SHOVELER Anas clypeata. Holarctic, but not in Turkestan or Tibet. 2 on the 9th October at Jomsom.

WHITE-EYED POCHARD Aythya nyroca. Southern Eurasia (in the Palaearctic). Singles on the 9th and 14th October at Jomsom.

Duck spp. 15 on a small pond south of Jomsom on the 11th October.

OSPREY Pandion haliaetus haliaetus. Northern Eurasia, coasts of the Mediterranean, Red Sea, Persian Gulf etc., occasionally in Assam and the Eastern Himalayas. Singles on the 4th and 27th September.

CRESTED HONEY BUZZARD Pernis ptilorhyncus orientalis. South Siberia to Japan. Singles on the 13th, 17th, 28th September and 2nd October. 3 on the 27th September and 2 on the 1st October. 2 an 3<sup>ro</sup> October new Beni.
BLACK KITE Milvus migrans lineatus. Central and Eastern Siberia south to China, Tibet and the higher Himalayas. 254 passed south between 4th

September and 1st October.

- PALLAS' FISHING-EAGLE Haliaetus leucoryphus. South-East Russia and Southern Siberia south to Tibet and Northern China. Also the North of India. Two on the 4th September, singles on the 6th, 14th and 24th September, 2 on the 1st October.
- SPARROW HAWK Accipiter nisus nisosimilis. Central and Eastern Siberia south to North China and the Tien Shan. 14 passed south between 6th September and 5th October.

LONG-LEGGED BUZZARD Buteo rufinus rufinus. From Greece eastwards through South-West Asia to Turkestan and Mongolia. 16 passed south between the 5th September and 12th October.

BUZZARD Buteo buteo japonicus. Eastern Siberia, West China, Tibet and ? Si<sup>st</sup> Aucust Eastern Himalayas. 45 passed south between the Sta Capton and the 14th October.

'Buzzard'spp. Buteo/Pernis. 10 between 17th September and 9th October, some resembled B.b.vulpinus.

STEPPE EAGLE Aquila rapax nipalensis. Central Asia. Singles on 23rd,25th, 26th September,4 on 1st October,1 on 3rd and 2 on 6th.

IMPERIAL EAGLE. Aquila heliac heliaca. Eastern Europe east to Southern Siberia. 2 on 30th September.

SPOTTED EAGLE Aquila clanga. Eastern Europe eastwards to Siberia. A single on the 17th September.

Large eagle (Aquila) spp. 1 on the 6th September.

HEN HARRIER Circus cyaneus cyaneus. Northern and Central Europe east to Siberia and Central Asia. A single on the 7th October.

PALLID HARRIER Circus macrourus. Eastern Europe east to Central Siberia and ? Mongolia. Singles on the 13th, 16th and 26th September.

MONTAGU'S HARRIER Circus pygargus. Europe east to Central Siberia, but not Central Asia. Singles on the 17th and 19th September.

MARSH HARRIER Circus aeruginosus aeruginosus. Europe to Central Siberia, south to Turkestan and South-West Asia (but not Tibet). 10 passed south between 6th September and 3rd October.

Harrier spp. Probably mostly C.macrourus). 9 between 13th September and 1st October.

PEREGRINE FALCON Falco peregrinus calidus. Eurasian tundras. 1 (almost certainly this race) on the 16th September.

- HOBBY Falco subbuteo subbuteo. Europe and North Africa east to Siberia and China, south to South-West Asia and Turkestan. Singles on the 16th, 25th and 27th September.
- RED-FOOTED FALCON Falco vespertinus amurensis. South-East Siberia south to North China. A single on the 1st October.
- KESTREL Falco tinnunculus tinnunculus/interstinctus. North Africa, Europe eastwards throughout the Palaearctic (including the Himalayas). The race interstinctus occurs in the Eastern Himalayas, South Tibet, China and Eastern Siberia. 11 passed south between 6th September and 6th October.
- Small falcon spp. Probably mostly F.tinnunculus, but 8 on 1st October accompanying the Red-footed Falcon (F.vespertinus amurensis) may well have been of that species. 37 passed south between 24th September and 10th October.
- CRANE Grus grus lilfordi. Throughout Siberia. 3751 passed south between 29th September and 14th October.
- DEMOISELLE CRANE Anthropoides virgo. North-West Africa and throughout the steppes of South-East Europe, Transcaspia, Central Asia, Southern Siberia, Mongolis and Manchuria. 2220 passed south between 30 th September and 14th October.
- Crane spp. Perhaps mostly A.virgo? 15,144 passed south between 24th September and 12th October.
- MOORHEN Gallinula chloropus chloropus. Throughout North Africa and Eurasia (including the Indian sub-continent and the Indo-Chinese countries) Singles on 8th, 14th, 15th and 18th September. Also 1 at Jomsom on 9th October

LITTLE RINGED PLOVER Charadrius dubius curonicus. North Africa and Eurasia

south to South-West Asia, Kashmir, Turkestan and North China (not Tibet). A single flying south-east near Suikhet, 30th August.

ASIATIC GOLDEN PLOVER Pluvialis dominica fulva. North Siberian tundra. A single on the 24th September.

TURNSTONE Arenaria interpres interpres. Arctic coast of Holarctic.

A single on the 14th September.

Calidris spp. 15 passed south on the 18th September.

TEMMINCK'S STINT Calidris temminckii. Tundras and forest tundras of Eurasia.

4-5 on 6th October near camp, then 35-38 in total at Jomsom from 9th-14th October.

GREENSHANK Tringa nebularia. Northern Eurasia. A single at Pokhara on 28th August, then singles at Jomsom on 9th and 10th October.

GREEN SANDPIPER Tringa ochropus. Northern Eurasia - sporadically further south. 26-27 recorded 13th September-14th October.

- WOOD SANDPIPER Tringa glareola. Northern Eurasia. 14 recorded 10th September to 9th October.
- COMMON SANDPIPER Tringa hypoleucos. Throughout Palaearctic Eurasia (including the Himalayas east to Kumaon). 50-52 recorded 7th September-9th October. May breed locally?
- SWIFT Apus apus apus/pekinensis. Almost throughout the Palaearctic, but not Tibet or the Himalayas. The race pekinensis occupies the region Central Asia and Northern China; also the North-West Himalayas. A single on the 9th September.
- KINGFISHER Alcedo athis atthis/bengalensis. The Mediterranean Basin east to Siberia, Turkestan and North-West India (atthis). The race bengalensis occurs in East Siberia, Mongolia south to China and much of the Oriental region(but not the higher Himalayas apparently). Singles on the 8th and 28th September, 2 on the 26th September.

HOOPOE Upupa epops epops/saturata. From North-West Africa, South and Central Europe east to Western Siberia, South-West and Central Asia (epops). The race saturata occurs in Central and Eastern Siberia south through Mongolia and China to South Tibet and the Eastern Himalayas. The race epops also occurs in the Punjab, Kashmir and Ladak - possibly West Tibet. 342-344 recorded 5th September-14th October - fluctuated from 0-49 in a day.

WRYNECK Jynx torquilla sarudnyi/chinensis. The former race occupies Western Siberia, the latter Central and Eastern Siberia, Mongolia and Western China. One captured was sarudnyi. 36-37 recorded 8th September-6th October. SAND MARTIN Riparia riparia diluta (presumably). South-West Siberia

through Central Asia (but not Tibet) to China, Assam and ? Burma. A single on the 10th October at Jomsom.

SWALLOW Hirundo rustica rustica/guttaralis. Nominate race occurs in Eurasia east to Central Siberia, Chinese Turkestan and in Himalayas to Sikkim. Race guttaralis occurs in much of Eastern Siberia, Mongolia, China and Tibet, as well as Eastern Himalayas. A single on 6th September, another on the 7th and 2 on the 9th.

- HOUSE MARTIN Delichon urbica cashmerensis/urbica. The race cashmerensis occurs from Afghanistan to West China, via the Himalayas and our birds were probably that su-species. They may just possibly have been urbica, which occurs, amongst other places, in Western Siberia and Turkestan. Singles on the 5th and 15th,2 on the 30th September and 16 on the 8th September.
- SHORT-TOED LARK Calandrella cinerea dukhunensis. Tibet. Also C.c.longipennis. Turkestan to Manchuria. Both races occurred - dukhunensis appeared to largely predominate. Recorded from 27th September to 14th October in mixed flocks with Hume's Short-toed Larks, C. cinerea predominating by about 2 to 1. Numbers built up from 46 on the 27th September to c1000 at Jomsom on 9th October, but only 150-200 by the 14th (N.B. These figures are the combined count for both species).
- HUME'S SHORT-TOED LARK Calandrella acutirostris tibetana . Ladakh, Tibet, the Tibetan-steppe facies of the high Himalayas. Up to 35 daily from 13th September to the 26th, then in larger numbers (see Short-toed Lark).
- GODLEWSKI'S (=BLYTH'S) PIPIT Anthus godlewskii. South Siberia, Mongolia and Tibet. Recorded from the 5th September to the 13th October. Only singles at first, but numbers reached 95-115 by the 14th and then declined slowly.
- INDIAN TREE PIPIT Anthus hodgsoni yunnanensis. North-East Russia through Siberia to Japan, south to Mongolia. 2 on the 9th and 1 on the 10th at October at Jomsom. A.h.hodgsoni was a common local breeder and some yunnanensis may have been overlooked.
- HODGSON'S PIPIT Anthus roseatus. Afghanistan, the High West China. A single at Jomsom on the 10th October may have originated from Tibet?
- YELLOW WAGTAIL Motacilla flava beema (some, but not all, certainly of this race). South-East Russia to Central Siberia. 6 at Jomsom on the 9th October, but 40+ on the 10th and c10 on the 11th. 4 on the 12th and 12 on the 14th.
- YELLOW-HEADED WAGTAIL Motacilla citreola calcarata. Iran east through Tibet to Inner Mongolia and West China. 2 on the 9th, 12 on the 10th and 1 on the 11th October at Jomsom. The race M.c. citreola( Siberia) may also have occurred for it was only possible to identify 4 adult males as calcarata.
- GREY WAGTAIL Motacilla cinerea cinerea. Europe and North-West Africa east to Siberia and the Himalayas. There is some possibility that local Grey Wagtails were augmented by Siberian migrants, but this doesn't seem tco likely. Up to 10 daily (numbers fluctuated) 4th September-6th October. WHITE WAGTAIL Motacilla alba personata/dukhunensis. The former occurs in
- Southern Siberia, Turkestan, parts of North Tibet, the Pamirs and Afghanistan etc. The latter breeds from South-East Russia and Transcaspia to Central

Siberia. The race M.a.baicalensis, of Central and Eastern Siberia south to Mongolia, may also occur, but was not identified with certainty. The proportion of non-alboides forms identified was fairly small. (M.a. alboides is the Himalayan/South Tibetan locally breeding form, which also showed signs of movement). The first appeared on 14th September, but numbers did not build up until the 7th October, when c45 were seen. Up to 35-40 were then observed daily at Jomsom from the 8th-14th October.

Singles on the 15th,17th,29th September and the 5th October. STARLING Sturnus vulgaris poltaratskyi/porphyronotus. The former occurs

RED-BACKED SHRIKE Lanius collurio isabellinus. Chinese Turkestan etc.

in Western and Central Siberia, the latter in Chinese Turkestan etc. A flock of c200 observed flying south on the 6th October.

BOOTED WARBLER Hippolais caligata caligata/rama. Former occurs in much of European Russia and West-Central Siberia, the latter in South-West Asia, Transcaspia and Turkestan. A single near Jomsom on the 30th

September.

- LESSER WHITETHROAT Sylvia curruca blythi. Central Siberia,? further east, south to Mongolia and perhaps Northern China. 3 on the 24th and 1 on 26th September. (Could perhaps refer to S.c.telengitica of the Altai and West Mongolia).
- CHIFFCHAFF Phylloscopus collybita tristis. Central Siberia. Singles on 23rd September and 3rd October.
- TICKELL'S WARBLER Phylloscopus affinis. High Himalayas, Tibet and Western China . Only 6 on the 7th September, when first recorded, but numbers built up to 50-60 by the 26th September and then rapidly declined in early October.
- RED-BREASTED FLYCATCHER Ficedula parva albicilla. Eastern Russia through Siberia and Mongolia. 2 on 4th and 5th,1 on the 8th and 1 on the 16th September.
- STONECHAT Saxicola torquata przewalskii. West China and Tibet. 87 recorded 8th September to 14th October.
- BLACK REDSTART Phoenicurus ochruros phoenicuroides. Iran and Transcaspia east to Turkestan, Mongolia, Western Tibet and the North-West Himalayas. A single at Pokhara on the 28th August, otherwise not recorded until 10th September (when 3) - building up to a peak of c100 at Jomsom on 10th October, declining subsequently.
- BLUETHROAT Luscinia svecica svecica/saturation. The former extends from Northern Europe through Siberia to Alaska, the latter occupies Southern Siberia, Mongolia and Turkestan. Single on the 14th September, 2 on the 29th and 30th. Then 1 on 6th October, 2 on the 9th and 1 on the 10th.

GOLDFINCH Carduelis carduelis paropanisi/caniceps. Possibly the former,

which occurs from Iran east to Turkestan, but one cannot exclude the possibility that the range of caniceps (West Himalayas) may extend further east than is supposed. 3 at Marpha on 21st September, 8 at Syang

#### on the 30th September.

N.B. The records of Moorhen (Gallinula chloropus) and Kingfisher (Alcedo atthis) may refer to resident birds, although they would be at an unusually high altitude (Salim Ali & Ripley) and in apparently rather unsuitable habitat.

#### OTHER OBSERVATIONS

We will in due course be preparing a full systematic list of the birds observed by the expedition in Nepal, but this must await clarification of the nomenclature, a detailed search of the literature and receipt of the observations made by two other groups in the Annapurna area in July-October (parties led by M.Woodcock and N.B.Davies), who have kindly consented to let us use their notes. Preliminary communications suggest that there will be some useful comparisons to be made between the lists.

Of the more interesting facts to come to light so far, the case of the Himalayan Tree-Creeper is a good example. This species, which is supposed to have a discontinuous range in the Western Himalayas (to  $81.31^{\circ}E$  - see Salim Ali & Ripley, Vol. IX, p.237) and South-East Asia, proved to be fairly common in the Kali Gandaki Valley ( $83.30^{\circ}E$ ) (identification by ringing/ photographs). The Nepal Tree-Creeper is supposed to replace this species in the Eastern Himalayas, but it was absent in the Tukche area. However, it was found in the moist forests on the southern flank of the Annapurna range by Woodcock - suggesting that there may be populations of Himalayan Tree-Creepers in the higher, drier parts of the major river valleys perhaps throughout the Eastern Himalayas.

In addition to the normal floristic and faunistic transition with altitude as one climbs from the wet, monsoon forests and paddies around Pokhara (2,600') to the high valleys, the extreme rain-shadow effect of the Himalayas has a profound effect in valleys such as the Kali Gandaki which penetrate the main range - originating in the!Tibetan' uplands to the north. Thus the avifauna at 8-10,000' in the Rhodedendron cloud-forest around Ghorapani, on the southern flank of Annapurna, was very different to that of the 'Alpine' temperate coniferous forests ,at a similar altitude, south of Tukche and quite unrelated to that of the arid, rocky, 'Tibetansteppe' around Jomsom (9,000'). Yet these three areas are only some 25 miles apart! Thus at Ghorapani the predominant groups are Timaliids (especially Laughing Thrushes), Flycatchers, Thrushes, Cuckoos etc., but in the Tukche area the Palaearctic character of the avifauna is more apparent with Larks, Pipits, Wagtails, Phylloscopus warblers, Chats, Tits and Finches perhaps the most typical components. Further north at Jomsom almost all forest species have disappeared.

#### CONCLUSION

Although this study has, hopefully, added to the stock of information on trans-Himalayan migration, it has posed as many questions as it has resolved. Clearly birds of more powerful flight (i.e. most of the larger non-Passerines) are quite capable of crossing the Tibetan Plateau as a matter of course on migration and their movements between Siberia, Central Asia and Tibet into the Indian sub-continent (and vice versa) may therefore be on a broad front, albeit rather more concentrated in suitable passes and valleys. However, although there is a distinct possibility that our study terminated too early to record some late autumn migrants, it seems likely that the volume of Passerine across the Plateau is comparatively small - provided one excludes the few species which are summer visitors to the Plateau itself. Nevertheless the validity of the theory that migrants (in this case Passerine migrants) enter the sub-continent by a circuituous route around the margins of the Plateau has yet to be convincingly demonstrated. In the hope of doing this it is cut intention to make a follow-up study in the Karakoram Himalayas in the autumn of 1975 or 1976. As can be seen from Fig. 2 , the high-altitude crossing between Siberia/Central Asia and Northern India in this area is quite small - involving flights of only c25 miles above 13,000' (minimum passes c15,500') compared with a minimum flight of 500 miles at 16-20,000' across the Tibetan Plateau to Central Nepal. Such extreme variation in the severity of the barriers which migrants have had to face may well have influenced the pattern of migration in the region and favoured a migratory 'divide' between migrants moving SE to South-East Asia (some penetrating to Assam and Eastern India) and others moving SW to Africa or North-West India (via the narrower ranges such as the Pamirs, Hindu Kush and the Karakoram). We intend to make a much longer study this time in the Hunza valley or the Indus valley in the region of Gilgit - since these valleys connect directly with the lowest, shortest passes in the region (e.g. the Karakoram Pass) leading to Chinese Turkestan and points north.