THE GARHWAL KUMAON HIMALAYAS

Jashbhai Patel
THE
GARHWAL
KUMAON
HIMALAYAS

JASHBHAII PATEL
This book is dedicated to my mother

Chanchalben Chandubhai Patel

and also to

Savita
(my elder sister)

Kusum
(my younger sister)

and

Ashok
(my youngest brother)

who were not with us on the pilgrimage to share our joy.
PREFACE

This book consists of four parts and the contents page displays the layout. The first part is titled "My Mother's Pilgrimage to the Himalayas" which indicates the limitation of this section. It describes a journey through the Himalayas for those who, like my mother, are in their seventies or eighties and cannot travel on foot. They sit in a bus or a car and see what passes by through a window. At places they are carried in chairs or if possible are made to ride on ponies. At all times, theirs is a window view and is cursory. There is the common man, who, although not old, is not in the habit of walking on nice city roads — much less would he rough it out through treacherous hilly terrain — and is always in a hurry to seek the nearest available vehicle to complete the journey in the shortest possible time. He will not get much of a different view. This part of the book is addressed to these two types who in reality form the majority. They will not miss much and will have a fairly good view of the snow and the countryside provided they keep awake while travelling in a vehicle — or while reading through this book. One more point to bear in mind is: a bus journey is always on a highway or a road. You have no choice as to either the routes or the halts. You have to accept whatever views come your way through your assigned seat-window. This is indeed a handicap and this travelogue is for handicapped people.

The writing of this pilgrim part also owes to my friend, the late Shri K. C. Chatterjee. He insisted that I put down my diary notes on paper. Lest I put it off, he took from his library a Bengali book on the Himalayas by Uma Prasad Mukherjee, the brother of the famous Shyama Prasad Mukherjee, and gave it to me to read even though he was not quite sure that I read Bengali. I went through it from cover to cover and to assure him translated a page from the book and mailed it to his address. He was pleasantly surprised to read the exact English translation. I mention this incident today to remember a friend who would have been glad to see my mother's pilgrimage in print.

Any pilgrimage should deal with religion and temples. I have avoided hearsay and legends. The reason for this omission is: If Truth is God and God is Truth, why should I be made to speak lies when I am writing on the holy Himalayas? Besides, many well-known pilgrims have written on the subject and I would need to repeat or copy them. A pilgrim who desires such information can readily obtain it from the various temple committees which will serve their purpose. Also, I have said nothing about boarding and lodging because in these inflationary times the charges will vary from year to year and any information I give will become meaningless in no time. Besides, travel agents and tourist offices do this job well. I need not interfere with their lucrative business.

As for my travelogue, I am fully aware that it might not appeal to hardy trekkers and fastidious literary men. However, if they will bear with me, there is something interesting for them too. That comes in the remaining parts of the book and covers almost the entire work, some 200 pages. A bus journey in the Himalayas is not a luxury. At times, it is extremely boring. A writer who wants to be honest should put all the things in proper perspective and this is what I have attempted in my book.

Pilgrim routes are not the best part of the Himalayas. The very fact that one needs the cholera injection to visit these places speaks of the unhygienic conditions there. Shri G.N. Kamat, who was not known to me then — and now a friend and a
constant hiking companion — visited Badrinath in the same month and year as I took my mother to the Himalayas. He was bored to his bones and was thoroughly disappointed with his journey. Had he been forewarned by an honest presentation of the region he would not have been deceived. But he had always been given a rosy picture of the Himalayas and he came away with a very poor impression. This book, I hope, will help to remove such impressions.

Before I left for the Himalayas, I too read some tourist literature. I could not find any information I wanted to gather and felt totally dejected. In all, I visited four tourist centres: one in Bombay, one in Baroda, one in Haridwar and one in Rishikesh. None of the receptionists there could tell me what I wanted to know. In the centres other than the one at Bombay, the receptionists were not found on their desks. When contacted with some difficulty, they had nothing to offer by way of tourist literature. From the Churchgate (Bombay) centre, I got a few cyclostyled sheets which listed towns, the distance between them and their heights. Yes, they had some more information as to whether a town has a tourist bungalow or not. After all, they are there to promote tourism and connected businesses. A receptionist in Baroda asked me why instead I should not tell him of the Himalayas on my return. This book is exactly an echo of that whimsical suggestion. I had decided then that I would do the necessary research and write a book on my return which would be of help to all.

I am not a writer and I never wanted to be one. Necessity had led me to writing. English is not my mother-tongue and I do not know what English literature is or what style means. Also, none of the Indian languages is my native tongue, although my lineage is wholly Indian from the state of Gujarat. As a child the first language I spoke was Swahili, my native tongue — the language of my birth-place Nairobi, Kenya. My regret is that I have forgotten it completely and I use English as my working language. Hence, if anyone finds my English not up to his mark, he will be magnanimous enough to pardon me. This is all I have to say by way of apology.

Now I say something about my book. It opens with a poetic description of the Himalayas. When we are through the pilgrimage part of the book, our expectation of the Himalayas aroused by the opening poem is not fulfilled. The reason for this disappointment is not difficult to guess. In the last two decades, the inroads made by modern civilization have ruined the roadside beauty of pilgrim routes more or less completely. To gain the right perspective of the Himalayas we turn to the second part of the book. There we study the topography of the Himalayas and then in three chapters of the third part we learn about the climate, flora and fauna of the Garhwal Kumaon Himalayas. Finally, in the fourth part, we obtain glimpses of old Kumaon and there we find fulfilment of the poetic promise by reading excerpts from the old travelogues. Some of these distant areas are even now not easily accessible and our hopes of saving and enjoying the beauty of Himalayas lie there.

Finally, there comes the bibliography. It is an integral part of the book and readers are requested not to skip through it, rather they should read it carefully. It tells you of what to find where. Also, the maps section is equally important. It tells you which map to consult in case you decide to visit any place in Garhwal or Kumaon.

A book of this kind cannot be wholly original. Authenticity of information will depend upon the books I have consulted. This, in turn, means that I have relied on the labours of many men and I am indebted to them all. Also, it might appear that I have violated all the cannons of copyright. This may be true legally. However,
I believe that I have been more than fair. Copyright is there to protect authorship of works and monetary gains of authors and publishers. In my case, I have acknowledged the authorship of works oftener than necessary. If I have at all missed doing so somewhere it is only inadvertently. My work is in a pre-print form and there is no question of any financial gain. All authors and publishers know well that a print order of just 200 or 250 copies can never fetch anyone any money. Thus, I have not taken the trouble of writing to authors and publishers for permission to use their works. Also, such a correspondence was and is beyond my financial means. In spite of this honest explanation, if anyone feels offended by my act of omission, I tender beforehand my unconditional apology, and acknowledge my indebtedness for having used the material.

Compilation of such a work calls for substantial financial aid and a competent team of supporting staff. In my case, I have done the entire work on my own and have wholly relied on my love of labour and the totally inadequate financial resources of my poor old mother. Writing itself took more than five years and another two or more years were spent in finding a printer. Thus, in all, eight long years have lapsed before the work could appear in print. Even then, the inadequacy of my effort glares at me. I know more of the gaps in my work than its merit. I think it would be futile on my part to speak of these. If I had my say, I would have given the satellite pictures of the Himalayan ranges and the panoramic views of them from as many vintage points as possible. I would have employed expert cartographers to prepare special maps for the drainage systems of rivers and glaciers. And then there would have been colour photographs of each and every peak, of birds and animals, of flowers and butterflies, of green meadows and trees. I would have missed nothing. It is nice to dream like a child but realities take over sooner or later. In my case I had to redo all the sketches because the available printing process would not allow shade or colour but only lines and dots. Readers who are disappointed by my book would do me a great service if they produce seven books for the seven Himalayan regions that are mentioned therein. I am in my 58th year and my chances of trekking in the Himalayas are remote. I would be amply rewarded if I see these books in my lifetime.

It would not be out of place if I mention that books on the Himalayas are not readily available for reading. To find all the necessary maps would prove extremely difficult. In fact, the present book has suffered on account of unavailability of certain maps. At present it seems that the Himalayas are the preserve of the defence forces. Mostly they are used for their sports. The Survey of India is perhaps in their hands. This passage is not written out of spite or as a criticism of the defence forces. Rather, I would implore the highest authorities in these forces to find out how much the Himalayas have suffered on their account and to see that this sublime countryside is compensated for their lapses because they possess skill, speed and efficiency.

Finally, printing of this book has become possible through the timely help of many men and women and the proper place to thank them all is in the acknowledgements section. However, I would like to mention here one name, that of my friend, Shri Subhash Shah, because his help came to me in the most unexpected manner. I had gone to him to receive subscription for seven books. He gave me an amount for eight books. Besides, he probed the problems I faced and, of his own, spontaneously offered open financial support, saying, go ahead with the work and do not wait to collect the remaining subscriptions. Such encouragement I had never expected from anyone and it was this moral support that took most of the financial load off my head. Further, a problem arose in procuring a map and he went all the way to Dehradun to get it. His generosity has touched me and I hope
all other helpers would agree with me that he deserves a special mention. The date of publication of the book got advanced because of him.

This edition is not for sale and is strictly for private circulation among persons who have contributed towards its cost. The copyright of the book is donated to the Himalayan Club because the author does not believe in the trade in knowledge. This might sound pompous. However, proof of this lies in the fact that the copyrights of his two earlier books, "Lectures on Gauge Field Theories" and "Satyendra Nath Bose, An Indian Physicist" too were donated to appropriate institutions — for example, the Indian Institute of Technology, Powai, Bombay, for the first of the two books. The Himalayan Club is a well-known institution and has a long record of promoting Himalayan studies through its publication, The Himalayan Journal. The author is grateful to the members of the Club for accepting the copyright of the book.

In the end, I must admit that I have written enough in defence of my book. This is so because I always keep in mind the words of Buddha:

O Atula! This is an old rule — not just a rule of today: "They blame him who sits silent; they blame him who speaks much; they even blame him who speaks little."
There is none in this world who is not blamed (Dhammapada).

JASHBHAI PATEL

Bombay

November 29, 1985
ACKNOWLEDGEMENTS

This book could be printed only because of the help received from several persons and I would like to take this opportunity to acknowledge it.

Earlier Dr. A. S. Mahajan and Shri Achintya Mukherjee had individually tried to find a publisher but their efforts did not succeed. Finally, Shri Achintya Mukherjee located a small printing press, where we, a few friends, decided to print this book.

An appeal for raising funds for the printing expenses was issued by Dr. S. S. Talwar, Dr. A. S. Mahajan, Dr. V. A. Shenai, Mr. Krishna Raj and Mr. Achintya Mukherjee. The appeal was a request for advance payment of Rs. 75/- per copy of the book. Unfortunately, this appeal came to nothing and I had to undertake person to person contact. In response to this Smt. S. Chatterjee and Shri K. Goradia, paid for 3 copies each, Sarvashri R. A. Dada, S. R. Desai, D. R. Dhanuka, G. N. Kamat, H. M. Mehta, R. M. Nayak, P. Parikh, P. Sankaranarayan, C. V. Sheth, S. S. Talwar and Smt. Prabhu paid for 2 copies each. The following persons paid for a copy each: Sarvashri Y. M. Ancolekar, A. K. Basak, P. C. Bhatia, G. Bhattacharya, N. Bhattacharya, K. Chheda, K. Dodeja, Bhakta Darshan, S. Ghosh, B. S. Jagdish, V. A. Kamath, S. N. Karmakar, B. Karanl, S. M. Lagu, A. S. Mahajan, H. Mistry, K. R. Mondkar, A. K. Mukherjee, D. Mukherjee, M. G. Narsian, G. Navlakha, A. Paul, K. H. Parekh, A. V. Patwardhan, M. S. Prabhekar, K. Raj, B. B. Rane, D. W. Rangnekar, D. V. Rege, P. Roy, M. M. Shanbhag, C. A. Shah, P. Shah, V. A. Shenai, P. V. Sheth, R. Tembolkar, J. K. Tijoriwala, S. A. P. Varghese, P. Vora, A. Vyas, Prof. Patravali, Prof. S. S. Warty, Smt. N. Chakrabarty, Smt. R. Peerbhoj, Smt. S. Shah, the Himalayan club, L.I.T., Powai, and Jyoti Studio. Even this effort of mine, spanning a few months, was not enough. At this stage the magnanimous offer from Shri Subhash Shah came, which I have mentioned in the Preface. From it I drew an amount equivalent to 45 copies. Shri A. K. Mukherjee also received a generous offer from Smt. R. Amin [Sarvashri G. Desai (1), Dholakia (1), S. Patki (1), and Prii & Co. (1)] for 25 copies. Dr. V. A. Shenai too received contribution for 10 copies each from his generous friends Shri R. H. Mehra, Shri K. S. S. Raghavan and one who prefers to remain anonymous. My friend Shri A. V. Sheth also paid for 10 copies. Finally, my mother Chanchalben and sister Kusum made up the target of 200 by taking the remaining 14 copies. Rs. 15,000/- collected in this manner made it possible to undertake the publication. Smt. (Dr.) N. Mukherjee donated the sheets for the cover of the book. Shri Mahendra Shah supplied the paper at a concessional rate.

The manuscript while under preparation was read by Dr. D. V. Rege and when finished by Dr. A. S. Mahajan and Shri Achintya Mukherjee. Dr. V. A. Shenai and Dr. D. W. Rangnekar also skipped through it. While editing the manuscript myself, I have taken some assistance from friends depending on their background. Their names are as under:

Smt. (Dr.) N. Mukherjee (Part I), Shri Krishna Raj (Part I), Dr. D. V. Rege (Part III) and Shri M. S. Petkar (layout). Shri Raj readily spared time for consultations and discussions. Shri S. C. Sarker translated Gurudev Rabindranath Tagore's Bengali poem into English.

My friend, Dr. V. A. Kamath showed me some books on Himalayas from his libraries at the B.A.R.C. and Nehru Centre, both in Bombay. Prof. Shri Kumar and staff of the Ramniran Ruia College, Bombay, permitted me to use their reference section. Dr. Ghatnekar, Dr. Kulkarni and other staff of the Botany department from this college located for me a few books in their field. I received cooperation from the librarian and staff of the S.N.T. University, of the Bombay University, both at Rajbai Tower and Vidyavangari campus, of the M. S. University, Baroda. Shri Jagdish Nanavati of the Himalayan Club provided photocopies of a few figures. Shri Homiar Mistry of the Hiker Club lent me a few books and in particular a photograph of Gangotri from which I made a sketch.
Several Survey of India maps of the Himalayan region were shown to me at the Geography department of the Bombay University by their staff. Sarvashri Bhakta Darshan, Joshi and R. M. Nayak helped me to get one of the maps. Shri Subhash Shah and his friends in Delhi, Lucknow and Mussoorie did their best in getting a map from the Survey of India.

The sketches of Himalayan ranges made by A. Gansser in his book "Geology of the Himalayas" (John Wiley & Sons, New York, 1964) are the best I have come across and are reproduced here. I acknowledge this. Shri Krishana Raj and Shri K. Vijaykumar arranged for photopoint setting and printing of the spread of the Himalayan ranges at Modern Arts and Industries, Bombay.

Shri H. M. Mehta helped me at times to read in poorly-lit hall the library index-cards which I could not see clearly on account of cataracts in my eyes.

I have tried my level best to recollect all the help I have received over the years, yet, I admit that I do not have a computer-memory and people who have suffered on this account should pardon me. I thank all whose names figure here and whose names do not. I hope, the book would satisfy them all.
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PART I
MY MOTHER’S PILGRIMAGE
TO THE HIMALAYAS
JAMNOTRI, GANGOTRI,
KEDARNATH AND
BADRINATH
O silent lord of the mountains
Your music soars through the skies
Articulated in high and low tones
In its wavy movement
From the doors of the morn to the eve's western nest
Traversing a not easily accessible and difficult path
One knows not in search of what message!
Having soared to the hard-to-reach peak
Your passionate expression
Seems suddenly to have lost its voice
Forgetting all the tunes.
Music of the hymns has lost the words
Gazing into the sky above
It has released a flowing stream.
O mountain, your youth
Impelled by an uncontrollable fiery intensity
Offered to exhaust itself into the clouds.
That heat is lost, that momentum is gone
Your wandering endeavour has become an ancient stone.
You have found your limit
So today with a peaceful heart in silence
You have merged yourself
Into the limitless.

published by the Government of West Bengal, Calcutta, Baisakh 1368, Bengali Samvat (May, 1961).

Written by Rabindranath Tagore on 26 Jaistha, 1310 Bengali Samvat (June, 1903).
Translated from the original Bengali by Subhash Chandra Sarker on 9th January, 1965 in Bombay.
This sweet little poem is from the pen of Rabindranath Tagore. It epitomises the spirit of the Himalayas: its vast ranges, eternally covered with snows; its snow-white peaks, whose spires seem to touch the very heavens; its clear deep blue skies, ever breathing the refreshingly pure air; the emerald green to turquoise blue waters of rivers and streams, murmuring sweet songs; its coniferous forests, dotted with wild flowers, spreading a sweet aroma; its multi-coloured birds chirping in the woods, or flitting over buds; its golden dawns, lifting the misty veil, unfolding the ever-changing panoramic vistas, tinged with myriad colours; its purple dusks, gradually turning into darkness, leaving behind the sparkling starry dome: all elevate Man's spirit, in deep reverential silence, to a sublime crescendo in Nature's divine symphony.

The Himalayas mean different things to different people: to the Hindus it means "abode of gods"; to the Sikhs, it is an important pilgrimage; to scientists, it is one of the youngest chain of mountains in the world, with its peculiar geological structure and distinct flora and fauna; to explorers and mountaineers, it is simply a mighty challenge. Yet, all recognise its physical beauty and grandeur. The Himalayas run in three parallel ranges: The "Great Himalayas", the "Middle Himalayas", and the "Outer Himalayas". The ranges stretch from Kashmir to Assam covering some 2,400 to 2,600 kilometres in length and some 300 to 500 kilometres in breadth. The Great Himalayas house some hundred or more snow-clad peaks each over 20,000 feet. The Middle Himalayas are the home of holy places of pilgrimage and the region between the Middle and the Outer Himalayas has a large number of beautiful hill stations, with forests and streams.

I was among the many who wanted to visit the Himalayas, at least once. But, for want of means, I could not do so for a long time. Finally, at the age of 50, I decided to go there somehow. But the question was which part to visit. This vast stretch of mountains has many beautiful zones: the Kashmir Himalayas, the Punjab Himachal Himalayas (Kulu, Kangra, Lahaul, Spiti, and Simla), the Garhwal Kumaon Himalayas (Mussorie, Nainital), the Nepal, Sikkim, Bhutan Himalayas, and last of all the Assam Himalayas. Each of these zones has its own character and merits, and it was not easy for me to make a choice. Eventually, I decided to take my 72 year old mother with me and visit the holy Garhwal Himalayas. I went there for my first acquaintance of those snow-clad mountains, and my mother for her last pilgrimage.

Garhwal, formerly called Tehri and Pauri-Garhwal, comprises five districts of Uttar Pradesh, namely, Dehradun, Uttarkashi, Tehri, Pauri-Garhwal and Chamoli. The four principal centres of pilgrimage, Jamnotri, Gangotri, Kedarnath and Badrinath, are divided between the districts of Uttarkashi and Chamoli. The Sikh centre of pilgrimage, Hemkund, is also not very far from Badrinath and is in the Chamoli district. These four centres of pilgrimage are the sources of the holy Ganga, "the river of India, which had held India's heart captive and drawn uncounted millions to her banks since the dawn of history". Her story "from her source to the sea, from old times to the new, is the story of India's civilization and culture, ... of the adventure of man, of the quest of the mind which has so occupied India's thinkers, of the richness and fulfilment of life as well as its denial and renunciation, of ups and downs, of growth and decay, of life and death." (Jawaharlal Nehru, The Discovery of India, Meridian Books Limited, London, 1951, (p. 35). For these sources, my mother and I set out.
May 19, 1977

It was 4 a.m., our time of departure from my sister's home in Baroda. We reached the station, from the other end of the city, much earlier than planned. But, we were lucky; the train arrived in time and we did not have to wait long. I got my reserved seat in the second class compartment and my mother her reserved berth and the seat. The train, Dehradun Express left Baroda around 6 a.m. The journey was uneventful, except for occasional petty quarrels among the passengers, who were otherwise quiet. Unlike an express train, the pace of the Dehradun Express was slow and it made frequent halts. Most of the time during the day, we gazed through our compartment's windows. But there was nothing much to see except parched fields, some small undulating hills and vast plains stretching up to the horizon. Fortunately, it had rained earlier and the few trees that we could see were washed clean and green. Patches of green were visible near rivers and streams. On the whole, it was a hot day and the journey was tiresome.

In the evening, as we approached Kota, for the first time the terrain changed. It became mountainous. The train began winding up the slopes through a tinder-dry forest. Because of showers earlier in the day everything was wet, clean and glistening in the evening glow, particularly the red-stone plates. It was cool and pleasant. We reached Kota in a fine frame of mind. The train halted until it was dark. Our onward journey, we passed in sleep. My mother missed the crystal clear blue waters of Chambal, so also, the tinder-dry dense forest of Ranthambhor, which, in due course of time, will become one of the major sanctuaries for the famed Indian tiger. But, the consolation was that she would make up this loss on our return journey, when we would pass through this region in broad daylight. When we woke up at 6 a.m. we were at New Delhi station.

May 20

The one hour halt at New Delhi was enough, but another three quarters of an hour at Old Delhi was a real punishment. It was a relief when the train moved out of the station and crossed the Jamuna bridge. We were now in the sugar belt of U.P. We could see nothing but sugarcane farms on rich alluvial soil of the Ganga-Jamuna plains. Canal waters, over which our train passed so often, fed them. We passed through the big towns of Meerut, Muzaffarnagar and came to Saharanpur. Again, we were in for a long halt. The train engine was shifted from the front to the rear. And finally, when the train moved, it was going backwards in a different direction. We passed through the pleasant town of Roorkee which has a row of magnificent trees along its roads. The nearby canal, which our train crossed, had a torrential flow of water. We came to Laksar. Again, the engine changed its position and went to the front. But this time the halt was mercifully brief; we soon moved towards our final destination, Haridwar. And I began writing postcards to my sisters. Before I could finish them, our train passed through beautifully laid out man-made forests, which were at times separated by wild growth. When we came out of the forest, our train stopped on the outskirts of Haridwar. It was the township of Bharat Electricals. We finally reached Haridwar, the door to God. When we got out of the train, it was just past 4 p.m. We decided to go to Rishikesh by bus.

After spending 40 hours on a train, the bus journey was really tedious. For one it was overcrowded. And we could hardly look around. The small window on my side was the only opening through which I could see. We were passing through a lovely hilly terrain, which was covered with northern tropical dry deciduous forest. When the bus stopped, most of the passengers got down. It was Hindustan Antibiotics. Its compound was impressive. The broad roads were lined with magnificent oaks,
my Kenyan childhood favourite, which my mother too recognised. We reached Rishikesh at dusk. But by the time we stepped into the Kali-Kamliwala Dharamsala, it was night. The keeper did not give us a room, because the rooms were for four or more persons. He had no consideration for my mother's age. We slept in a verandah. My mother had her first taste of a holy place. She was indeed depressed.

In the morning, I met one of the trustees. I explained my position and requested him to give us a small room which we got after some discussion. I made my mother comfortable and went out to buy bus tickets for our onward journey. In the afternoon, I took my mother for her second dip in Ganga. Her first one had been at Kanpur, in 1967, where I was teaching at the Indian Institute of Technology. We returned in the evening and went to sleep, early as we had to catch the first bus in the morning for Jamnotri.

May 22

We arrived at the bus station a full hour ahead of the scheduled departure time. Yet, the bus was overflowing with passengers. After a lot of fuss, the bus left much behind schedule. The sun was already high on the eastern horizon when we reached the bifurcation of the road on the outskirts of the city. We took the road leading to Narendranagar instead of the one leading to Deoprayag (See Map, p. 6).

Our journey to Jamnotri really commenced from here. The bus was going through the continuation of the same thick Rishikesh forest, winding up the steep slopes, and, at times, the ascent was breath-takingly sharp. At every hairpin bend we got a magnificent view of the graceful Ganga and of its course through the Rishikesh-Haridwar valley below. We climbed more than 2,700 feet in our 16 km run. Our bus stopped at Narendranagar where we took a light breakfast. The road was now even and the incline gentle. After 33 km, the road started descending. We passed through terraced fields and saw sometimes a few clusters of pine trees on the hill tops. The small villages we came across seemed to rest precariously on the edges of narrow flat ridges. It was marvellous. The onward run brought the Chamba township in view. It was on a fine hillock. Our bus was again groaning up the incline. When we reached the top, we by-passed the town and sped down to Tehri. We did not enter the township of Tehri, but stopped just outside the bridge on Bhagirathi, leading to Tehri. The road now ran close to Bhagirathi. The houses along the sides appeared modern. On the far end of the Bhagirathi bank rose a mighty wall of a tall mountain some 5,000 feet high. At the end of this mountain, its edge tapered into the river and Bhagirathi took a sharp turn of more than a hundred degrees. The road too turned. And, what a sight! The play of sunlight on the emerald green waters below and the green vegetation above was beyond the pen of any poet. Now the road zigzagged along the Bhagirathi bank, and our eyes feasted on her beauty. We by-passed the town of Dharasu and entered the district of Uttarkashi, which the local people call Uttarakhand. We did not proceed to Uttarkashi, but at the first bifurcation, left the Bhagirathi bank and turned into a road cut in the slope of a mountain. It led to Badakot, and further on to Jamuna and Jamnotri. We now passed through the loveliest of pine forests that I have ever seen in this country. In the beginning it was thin, but became progressively thicker. The road too was winding upwards without end, and although the hairpin bends were fewer, when they did come, they took the passengers' breath away. The side of the road was simply precipitous. We were well up on the mountain, but the end was not reached. The air became noticeably cooler and the Himalayan rhododendron bushes with their blood-red flowers appeared. I saw these flowers for the first time in my life; earlier I had also got a glimpse of a Himalayan eagle flying in the distant
GUIDE MAP OF
UTTRAKHAND YATRA ROUTES

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sky between Tehri and Dharasu. These impressions got etched in my mind. Finally our bus made it to the top of the mountain. It stopped to cool. I helped my mother alight from the bus and walked a little down the road stopping near a few rhododendron trees. Below, we could see a deep valley, dressed in fine conifers. And beyond was the continuation of the mountains covered with the same kind of forests. Further still was the Bunderpoonch range, peering out of a blanket of clouds, bathed in bright sunshine, the snow-white peak glowed whiter still. This was, what I would like to call, the grand 'Badakot view', our first sight of the Himalayan snows.

We returned to the bus and took our seats. It now sped down the other side of the mountain leading to Badakot. We did not proceed right up to Badakot but branched out at Dandiyalgaon proceeding towards Gangani. The road now ran along the main tributary of Ganga, the regal Jamuna. At Gangani, Jamuna is closest to Bhagirathi, but they do not meet because of the huge mountain in between. We were informed that a 16 km road linking Gangani (on Jamuna) with Nakhuri (on Bhagirathi) was being planned. We left Gangani for Kuthnaur. The going was rough as the road was in very bad condition. When we reached Kuthnaur, we were late for the 'gate pass' which would allow the convoy to proceed. From now on the road was narrow and slippery. The traffic was one way. All vehicles went in a single convoy. We had to wait for the convoy from the other end to pass. During this long halt at Kuthnaur we went down to a small bridge on Jamuna to see her clear waters running down to the plains. From another mountain nearby a stream roasted down the boulders to meet Jamuna. We went to the stream, washed ourselves and sat down to take our light lunch, which we had packed. We drank the ice-cold water from the stream and returned to our bus, which had already positioned itself in the convoy. At the appointed hour, the gate-bar was lifted and our convoy moved slowly towards the small bridge crossing it one by one. We were now on the other bank of Jamuna. The road was cut along the side of the mountain and the open side fell straight into the river. The driver of the bus was extremely cautious since the road was wet at some places on account of the rains earlier in the afternoon.

We reached the small bridge leading to Sayanchatti when it was already dark. Again the vehicles crossed the bridge one by one. We were now on the original side of Jamuna and there was a small clearing between the mountains and the river. This was Sayanchatti, which got crowded in no time with buses, jeeps and cars. This was the last bus-stop on the motor road. We got down and retrieved our luggage from the roof of the bus. Now the problem was to find a place to rest at night. For a while we contemplated going to Hanumanchatti, 7 km away by a private jeep, which we thought would be less crowded. But, I decided against it. My weak old mother was too tired after 12 hours of bus journey. She needed early rest. It was dark, and the road, even though no more dangerous than the one we had just traversed, was officially not open. Besides, the jeep operators charged exorbitant rates.

The Travellers' Lodge was full. So we hired a tent, with two cots, one chair and a lantern for Rs. 10. I had a comfortable sleeping bag and heavy blankets for my mother in my rucksack. With these I made a bed for her and she spent a comfortable night in the tent. In the morning she could take a hot water bath at the Lodge and was refreshed. I had no problem because at this altitude a tent with a cot was a luxury.

May 23

It was 7 a.m. I now realised the beauty of the place. It was surrounded by mountains on all sides. In the woods were the Himalayan birds pouring out their morning melodies. Just away from my tent was Jamuna keeping her rhythmic flow. It was indeed a lovely morning. And, it was time to start on our onward journey on foot.
My mother sat in a 'kandi', a basket-like contraption for her to be carried by a carrier on his back. I lifted my rucksack on my back. It weighed 8 to 10 kg. With a staff in my hand, I took my first steps on the steep slope ahead. The man carrying the 'kandi' followed. After taking a short cut, we came to a jeepable road leading to Hanumanchatti which runs along the banks of Jamuna. Jamnatri was 18 to 20 km from here. We walked fast in the bracing climate to cover as much distance as we could during the morning hours. In the afternoon we would slow down. The walk was enchanting. There were mountains on both the sides and the river and the road in between. The slopes were wooded. Ahead at every turn, was an ever-changing panorama. We sighted a snow-covered crest and I asked our Nepali carrier to let my mother walk through the beautiful surroundings till she felt too tired to walk. This was our practice throughout our sojourn in the Himalayas.

We came first to Ramchatti and then to Hanumanchatti. At every chatti (a temporary resting place for pilgrims) we saw different parts of the long Bunderpoonch range. We rested at Hanumanchatti. I took my breakfast and my mother her favourite hot drink, "Ukala": milk, water, sugar and spices. To our Nepali carrier we gave tea and snacks from his favourite chatti. It was time to move on. The road was no longer jeepable but the usual bridle-path. We went along protecting ourselves from the caravan of mules.

We were now on a level ground and saw for the first time wheat fields. After resting at Jangalchatti, we headed for Phoolchatti. The view was widening and the river had branched away from the path. When we came near Phoolchatti, we saw Jamuna cascading over huge boulders, giving the appearance of a minor water-fall. When we entered Phoolchatti it was past noon. We decided to take our lunch here. We selected a big hutment with a cot on which there was a brand new, and hence clean, mattress, a rarity in such a place. I asked my mother to rest on the bed and I went out for a wash. A little later, I brought water for her too and she washed and got refreshed. The lunch consisted of rice, dal and potato-gram 'sabji'. After our meal, my mother rested for another half an hour and then we started again.

From Sayanchatti to Phoolchatti we were certainly climbing, but the ascent and descent were so gradual that they were hardly noticeable. At the end of Phoolchatti we came across a cluster of stunted trees looking like sisam. From there the path took a turn on a steep incline. Each turn now was steeper. Jamuna too turned and came closer once again, but she was far below. We were now on our way to Jankichatti. We rested at a few places on the way but reached Jankichatti in time. My mother was exhausted and the 'kandi' was in no way comfortable. We took a long rest before departing for the last lap. I let my mother walk for a while because she was sick of her 'kandi'. But it was not easy for her to walk and she had to use the 'kandi' although she could not bear the sight of our struggling and panting Nepali carrier. She was accusing herself of cruelty to man but neither the carrier nor I had a way of consoling her. Had I known at that time what Kaka Karelkar, a Gandhian author, had written, I could have consoled her. He had said, "Going to the Himalayas by foot is 100% 'punya'; going by 'kandi' is 50%; and going by any other means is nil." Anyway my mother, at her age and in the condition of her health, had no alternative but to take human help. She could not even ride a pony. I consoled her as best as I could. I told her: "Look, old age is as good as another infancy and a child is always carried by human beings. So do not torture yourself with guilt. In your case taking help of another human being is no sin." Willy-nilly she had to continue with the arrangement.
We were now in a gorge. Jamuna was flowing so close that we could hear her roaring below. The mountain on the opposite side was so near that we could see birds flying over the alpine forest. On our side of the mountain the path was becoming narrower and we had to keep away from the river. When we came close to the mountain walls I had to protect my rucksack from bumping against the uneven surface and my mother her head from the projecting boulders. The entire bridle-path was cut along the mountain side and at places it was so dangerous that everyone had to get down from their 'kandis'. My mother must have walked about a kilometre on this path in several laps and three kilometres in the whole day. As we approached Jamnotri the gorge became narrower and the mountains rose higher and higher. Besides, the gorge was turning round and round. And the mighty Jamuna was cascading down from boulder to boulder. We were now at the foot of our last climb. We could see the inclines ahead of us. They were steep, short and winding. Everyone was exhausted and rested as soon as a convenient spot was found. Slowly and wearily everyone made to the top. We rounded the shoulder of a mountain. On the other side of the river stood a high snow-covered mountain. We were in Jamnotri. The path ahead of us ran down to a wooden bridge and closeby stood the Kali-Kamliwala Dharamsala.

Our Nepali carrier lowered his 'kandi' on the steps of the Dharamsala. But my mother could not raise herself and I had to help her to get up. She was shivering from the intense cold in spite of the two shawls that wrapped her, whereas I was not even aware of it. I took out a heavy blanket from my rucksack and wrapped it round her and made her sit a while. I went out in search of a room. But once again I failed. This time I took the help of a forest ranger whom I happened to meet but he too failed. Finally, seeing my mother's age he offered to accommodate us in his room at the forest bungalow, which was on the slope of the snow-covered mountain. I lifted my mother and put her in the 'kandi' and we were once again on the march. When we reached the bungalow, it was dark. The ranger opened the bungalow and directed us to the fireplace. I pulled up a chair for my mother near the leaping flames with crackling sound. She was now relaxed. I made her bed near the fire fetching a cot from the adjoining room. After taking her 'ukala', she went to sleep. I chatted for a while with the ranger. He informed me that little wild life is found in these forests. Then I too pulled up a cot, made my bed and went to sleep.

May 24

It was dawn. My mother was sound asleep. I went out for a survey of the surroundings and for my ablutions. The mountain behind the bungalow was now in full view. The snow-line was hardly a few hundred feet away. Below all around were fine conifers. A little away in the woods I could hear a running stream but could not see it. I followed the sound and reached the stream. When I returned to the bungalow, I carried water in a bag from this stream for my mother. I warmed it and woke her as it was time for the ranger to go out. She washed herself with the warm water and I packed my rucksack. We were on our way to the Jamnotri temple.
JAMNOTRI  (Sketch by the author)

Jamnotri is 10,800 feet above the sea level. The place is rugged and streams roar down from steep mountain slopes and deep ravines. They rush down to the gorge below. The temple is situated on a steep slope near a ravine. The roaring stream here is Jamuna. Nearby is a hot spring 'Kund'. The temperature of the water in the 'kund' is 32.4 °C. Pilgrims bathe in it and visit the temple above. The temple is a plain four walled structure with a roof and hardly looks like a temple. Pilgrims visit it with deep religious fervour.

I took my mother slowly over a rough track to this hot 'kund'. She took her bath, changed her clothes and went with a woman, who had helped her in taking her bath, to the temple above. In the meanwhile I took my bath, washed the clothes and put them to dry in the sun on a nearby dilapidated stone wall. My mother returned after her 'puja', but we had to wait until the clothes dried. During this time, I went out to look for our Nepali carrier, whom I spotted at a tea shop. I returned, collected our clothes and placed them in my rucksack and brought my mother to the tea shop. We took our breakfast here and asked our Nepali carrier to bring his 'kandi'.

It was 10 a.m., time to begin our downward trek. My mother preferred to walk, because she was feeling strong. But, our Nepali carrier did not like this decision. It meant slow walk and he wanted to reach Sayanachatti as soon as possible. During our upward journey it was different. Whenever my mother got down from the 'kandi' he got relief, but now it meant a long delay. I let my mother walk for a while and then explained to her our carrier’s displeasure. She immediately agreed to sit in the 'kandi'. Our Nepali carrier was now happy and began running down with my mother on his back.
We came down to Phoolchatti. It was nearing 2 p.m. We took our lunch and then departed. Soon an electrical storm broke out somewhere between Phoolchatti and Jangalchatti. A fellow traveller stopped me to inquire about the condition above. While I was giving information to this gentleman, our Nepali carrier gave me the slip. When I finished, I started looking for him. But he was not to be seen. I thought he might be coming from behind, so I waited. During this time I was tense and off my guard. I did not notice a pony running towards me from behind. I could barely save myself but the pony stepped on my shoe. I was wearing my U.S. military shoes, and no visible damage was done, but later my little toe got swollen, which troubled me throughout the remaining journey.

I now enquired with the people climbing up if they had seen an old woman. All of them answered in the affirmative. I was assured now that my mother was ahead. It had started raining, yet I kept on running. When I reached Jangalchatti I saw my mother sitting on a bench. She said that she was worried about me but the Nepali had refused to stop under a shelter. Anyway she was not drenched and was warming herself near a fire. Now I was really angry with our Nepali carrier. The threat of being reported to the Government agency had some sobering effect on him.

I lowered my rucksack. It was wet. I opened it and poured out the contents on the bench and in my mother’s hands. Fortunately, it was not wet inside. I wrapped everything in a plastic sheet and put it back in the sack. I kept the sack to dry near the fire. And, we decided to wait at the chatti until the rain stopped. After half an hour the weather cleared. We stepped out of the chatti and made it to Sayanachatti without any further incident. It was not dark, but it was late enough. Again I had some problem in finding a place to sleep. Once again, we got the tent arrangement with the Travellers’ Lodge. After having made ourselves comfortable, I went out to buy the next day’s tickets for Lanka. Our bus was to leave at 6 a.m. sharp. So, after a light supper, we retired early.

May 25

It was 5 a.m. We were already in the bus. We were sitting in the front seats. The first thing I did in the bus was to repair my mother’s glasses with a string. That it worked was a great relief to me. Because my mother could have seen nothing on the way without them. The bus left at 6 a.m. sharp in a convoy. Once again, the vehicles crossed the bridges one by one. We retraced our path up to Kuthnaur and then freed ourselves from the convoy. From Kuthnaur to Gangani to ‘Badakot view’ it was all a continuous climb. From there to the bifurcation and then to Uttarkashi it was a great descent. From the bifurcation we again followed Bhagirathi right up to Gangotri. At Uttarkashi, Bhagirathi flowed from south to north, just as Ganges at Varanasi. This Kashi, like Varanasi, is also bounded by two streams, Varuna in north and Ashi in south. These meet Bhagirathi. This explains why this place is called Uttarkashi (see page 12).

The place is too urban for the Himalayas. It is in a fairly wide valley some 25 square kilometres in area. The town runs along Bhagirathi and we passed right through it. The Nehru Institute of Mountaineering is located here. It is at an altitude of 3,800 feet.

From Uttarkashi to Maneri (5,100 ft), to Bhatwari (6,000 ft) to Gangnani (7,000 ft) the incline and descent were gradual. From Maneri onwards the course of Bhagirathi had few bends. A little after Gangnani we passed through a fairly long gorge. The
UTTARKASHI  (Sketch by the author)
mountains were high but devoid of much vegetation. The journey up to this point was dull. After leaving this gorge, at about 25 km from Harsil, a hairpin bend climb began. The bus was groaning up the incline and at every turn we got a view of the snow-line. The mountains were barren and the snow scant. The few trees we saw were sickly. After reaching the top, we found the road descending right up to the bed of Bhagirathi. The view was fantastic. The bed was flat and unusually wide. The river was flowing gently. The sand on the bank was glittering splendidly. And, even as we were watching this spectacle, we arrived right on the bank of the river. There was a check post. A man opened the gate, and allowed our bus to pass on to the bridge spanning Bhagirathi at this point. From the bridge, we saw the graceful bend of the river and its bed. Now we were on the other bank of the river, and followed it right up to Jhala. The trees on the river bank and on the adjoining mountains were healthier and became progressively luxurious as we approached Harsil. The surroundings of Harsil, Kapang and Lanka were simply beautiful. Lanka was the terminus for the bus and we had to continue our journey on foot.

I asked my mother whether I should hire a 'kandi' for her. She refused since the distance between Lanka and Bhaironghati was just 3 km. But it was not an ordinary walk. It was far beyond her strength. Yet she insisted on walking because she did not want human labour as far as she could help it. But the 'kandiwallas' were not happy about her decision and pestered us all the way. Not to tax my mother's strength we would sit and rest every 250 metres when the going was easy. When it was difficult we would halt every 50 metres. We guessed at the most it would take us one and a half hours to complete the trek and I had all the patience.

Before commencing our downward trek I asked my mother to eat well and rest. Around 4 p.m. we started. We walked down a fairly long and steep incline which turned sharply at the base. At the turn, Bhagirathi came in full view. She was flowing through a magnificent gorge now. All around were mountains covered with beautiful trees. Above the tree-line were the crests of still higher mountains whose surface was covered with snow. We were wading through the bridle-path so close to the river that I tossed a stone or two like a child. The river was unusually clear. Bhagirathi is normally silt-charged and turbid. This was in sharp contrast to Jamuna. However, at this place another stream called Jada-Ganga or Janhavi, whose waters were crystal clear met Bhagirathi. This made the river less turbid. The path was perilous at places and railings were provided for pilgrims. These were of great help to my mother because holding them she could walk without my assistance. We were going slowly and with frequent halts. So far the climbs were gradual and few and my mother managed well. Yet she was completely exhausted. Also, all other pilgrims had gone ahead and we were the only two left in the forest. She was again and again reminded of the kandiwallas' warning that we were sure to miss the bus from Bhaironghati. But I assured my mother.

We were now at the base of a mountain and our path was winding up. This was to be steep and the longest. Also, that was to be the end of the trek. I asked my mother to sit on a stone and enjoy the beautiful scenery and the river. I too found a seat so that I could put down my rucksack and sit at the same time. Before me was a huge rock in the river. On it were two multi-coloured Himalayan birds. The red on the heads was most conspicuous, but it was not possible to identify them as I had little knowledge of the birds of Himalayas. They were singing heartily. It was getting dark and we had a long way to go.
Resting every 10 metres, my mother finally succeeded in climbing the famous invincible Bhaironghati. But to her sorrow, all the buses had left. She was told she would get none tonight. Again, I reassured her. Before dark, a truck-load of pilgrims did arrive. And, to make money, they did run two buses instead of one. There was little that we could see on the way. The sunlight was insufficient. But this did not bother me. I knew that we would be able to see the region on our return journey. When the bus arrived at Gangotri, it was dark. I asked someone to show me the path to Dandiswami's Dharamsala. He showed me the lights on the other bank of Bhagirathi and outlined the way to it.

Holding my mother with one hand, I guided her on a wooden bridge over Bhagirathi. We went over another bridge over Kedar-Ganga, a stream from Kedarnath. The two met a little way down. We now followed Kedar-Ganga and soon reached the lights which I held as the pole-star. I met the Swamiji. He noticed my tired old mother. He immediately instructed that the best room in the Dharamsala be given to us. For once my mother was pleased. She had got the right reception. The room contained wooden cots with heavy mattresses and warm quilts. The toilet was close by. One could not ask for more in the Himalayas. We washed, changed and got ready for supper. After the meal my mother went to bed as she was very tired. I sat down to write my diary. But sleep overtook me too.
May 26

I got up at dawn. Bhagirathi was singing her way down, mixing her melodies with those of birds. The morning was sunny and bright. This made me happy because it would not be too hard on my mother. The place was certainly less cold than Jamnotri. Perhaps this was due to the height and terrain. Gangotri, unlike Jamnotri, is not in a ravine, but in a beautiful valley. The height is little less than that of Jamnotri, being 10,300 feet above the sea level. Many 'sadhus' live here. Their dwellings are either on the bank of Bhagirathi or are scattered in the woods on the beautiful hill slopes. The place is not too wild for settlement. Also, snow-covered peaks are much farther away compared to Jamnotri.

My mother was much better when she got up. My anxiety about her health disappeared like the morning mist. I brought her two buckets full of hot water and placed them in the bathroom. She took her bath and got ready for breakfast. She ate biscuits with 'ukala'. I asked her to rest until noon. The idea was to take her to the temple when it was warm. But the weather took a sudden change. Clouds enveloped the valley and it became chilly. I took my mother to a fireplace. There she met a party of pilgrims from Gujarat, who had come by special buses with their own cooks. She chatted with them. Later, they gave her lunch. For the first time after leaving Baroda she ate her familiar home cooked food. She ate well and I was happy. By now the cold became intense and it began to rain. I was not sure if the weather would improve. So I took my mother to our room and I asked her to rest. I took up writing my diary from where I had left off the previous night.
At 3 p.m., all of a sudden the weather changed for the better. It became sunny and warm. My mother noticed the change. She asked me whether we could go out to the temple. I set aside my writing and got ready. I took her over the two bridges and came to the bazaar. At the end of it was the temple. We went in through a gate. It was a small courtyard. In the centre stood the temple. Its 'shikhar' (spire) was not tall, but had four cornices at the corners. The shikhar too had the usual 'pataka' (temple flag). Away from the shikhar, on the four corners of the roof were four bigger cornices. The whole structure looked square in shape. It was not at all impressive or beautiful. Yet, unlike Jannotri, it had some semblance of a temple. Outside the courtyard, on the riverside was the bed of Bhagirathi. In May, the water had receded to a distance and we walked through the stone littered bed. When our feet touched the water it was ice-cold. Standing in the water, my mother performed her 'puja' with the help of a priest. I looked on. The water was turbid, but not dirty. The width of the river was not small and the current was rapid. The entire river bed was fairly broad on level ground and was picturesque. When we turned back to go to the temple we saw the side of a mountain, full of trees, sloping down. My mother went inside the temple and once again performed the 'puja'. She paid the 'pujaris' (priests) their dues and we returned to the bazaar. We made a few enquiries about the bus timings and came over the bridge.

It was a beautiful evening. Sun-rays were playing on the rippling waters of Bhagirathi. Standing on the bridge, looking towards the temple, in the distance, we saw a long range of mountains. Above this range were snow-covered peaks after peaks, all aflame in the evening glow. We gazed at this spectacle for a while and returned to our Dharamsala slowly.

It was late in the evening. And, it was time to see the Swamiji, because we were to leave next morning. We told him of our intention of going to Kedarnath. My mother gave him the appropriate 'dan' (offering) and we took his leave. After supper, my mother went to bed because she had to get up early in the cold. I went out to meet another Swamiji to gather some more information about the onward route. When I returned to our room my mother was fast asleep. I, too, was tired and went to sleep.

May 27

We left Dandiswami's Dharamsala at 7.30 a.m. When we arrived at the bus stand we were alone. The bus was not there yet. When it arrived, we took our seats and waited until it was full. We left around 8 a.m. It was about 20-minute run to Bhaironghati. The view that we had missed earlier was right before our eyes. Bhagirathi was racing down with us. Yonder were the snow-covered peaks which came in view in quick succession. It was a pleasant morning. More so, because it had rained at night. We reached Bhaironghati and woke from our reverie. We got down from the bus and sat on a stone to enjoy the scenery. I wanted my mother to relax as much as she could. Another ordeal was in store for her. Because the return journey was in no way easier than the previous one. The climb to Lanka was very steep, though short.

We began going down slowly. We rested whenever my mother wanted to rest. The views were from the top and looked magnificent. I enjoyed them whereas my mother sat down panting with her eyes closed. The pilgrims were racing down, making my mother sad because she knew that she would miss the bus. But there was no other way. No one could avoid old age, and she was old. Slowly we reached Lanka. All the 'kandiwallas' cheered my mother as if she had conquered a Himalayan peak. Just as we arrived on the road a bus left. The pilgrims in the speeding bus
waved cheerfully to my mother acknowledging her feat. I waved back. I did not know then that we would meet them in the evening. A landslide was to block their passage.

Lanka looked splendid. It was rain-washed and sparkling. Wherever I lifted my eyes I saw snow-covered mountains. To my left was one such cluster, to my right another. The trees too were sparkling. A stately blue-pine stood tall. The branches of giant deodars spanned one another. The light filtering through the leaves wove a tapestry on the ground. The scene was enchanting. But, the mood did not last for long. The booking clerk would not issue tickets unless the first class tickets were booked first. And no one liked to buy first class tickets; we had to wait endlessly. So far our buses had had no classes. But this was a new experience. At last, three well-to-do pilgrims lost their patience. They bought three first class tickets. Another four first class tickets were bought by a group of 24 pilgrims. They were the first to get 20 second class tickets. Then I got 2 second class tickets for Sonprayag. But, we were fortunate to get our seats in the row next to the first class because the first three first class pilgrims had kept the window seats for us. We all took our seats and the bus left around 3 p.m.

The bus sped down the mountains swiftly. The scenery flew past rapidly. This time the view was from above. We passed Kapang, Harshil, Jhala one after another. We crossed Bhagirathi once again and came to the hairpin bend climb. Once again we saw snow-covered mountains near by. The snow this time was fresh. We came down the road. But, a landslide blocked the road resulting in a long queue of vehicles. Some 20 workmen were trying to push the rock that blocked the road towards the bed of Bhagirathi using long poles. They had slipped poles below the rock.

The struggle went on but the rock would not budge. I met the pilgrims whom I had seen in the bus in the morning. They told me that they had been waiting there since morning. They had not eaten. Drinking water too was not available. And they did not know when the rock would be lifted. I too joined them in watching the grim battle. After a long struggle they brought the rock to the edge of the road, and toppled it into the river below with a loud thud. A full-throated joyous cry went up. One by one the vehicles passed. It was already past 5 p.m.

When we reached Uttarkashi it was night. The driver stopped our bus in front of the Birla Dharamsala. We went in but could not get a room. I requested the attendant to allow us to sleep in the verandah on the first floor. I paid him the charges and he gave me the receipt. I dumped my rucksack in one corner of the verandah and asked a pilgrim to look after it while we went to an adjoining hotel for dinner. We spent the night in the verandah.

May 28

We were up by 3 a.m. By 4 a.m. we had occupied our seats in the bus proceeding from Uttarkashi to Sonprayag— a distance of more than 200 km. Lanka to Sonprayag was the longest run in our itinerary. It was in all 317 km. This was certainly a longer run than either the Rishikesh-Sayanachatti or the Sayanachatti-Lanka run, which was about 205 km. We left Uttarkashi around 4.20 a.m. when all the passengers had taken their seats.

From Uttarkashi to Tehri we retraced our path along the beautiful Bhagirathi. When we arrived near Tehri, it was already morning. This time we did not stop outside the bridge on Bhagirathi, but crossed it to enter the township stopping there for breakfast.
Tehri was the former capital of the Tehri-Garhwal state. A major town in the region, it is situated on the left bank of Bhagirathi and is enclosed within an inverted bend of Bhila-Ganga, her tributary. It is at an altitude of 2,070 feet. It is not as urbanised as Uttarkashi.

The road after Tehri meandered along a river. To my left were precipitous mountains, to my right terraced fields. The accent in the region was on agriculture. I saw some unusual irrigation methods and facilities. Slowly we were moving out of rugged terrain and were heading towards the twin towns of Kirtinagar-Srinagar. When we passed through Kirtinagar we came upon a bridge on the river Alaksnanda, the sister of Bhagirathi. Crossing the bridge we entered Srinagar.

Now our road meandered along the bank of the lovely Alaksnanda. Her bends and turns were graceful. But her waters were much more silt-charged than those of Bhagirathi and at times were very muddy. We were on our way to Rudraprayag. Once again the road was blocked. This time not due to a landslide, but an accident. We got a chance to come out of the bus. We were at a height. Far below was Alaksnanda turning round a low lying mountain. The further end appeared wider and at our end she was narrower. Her waters were sparkling in the sun. The low lying mountain was densely wooded. The growth was chaotic and not too tall. Yet it was green all around. It was pleasing to the eye. 'Beautiful', my mother exclaimed.

We returned to the bus when the road was cleared. We were speeding to Rudraprayag, which was now not too far. When we entered the town, the bus stopped at a service station for a check up. We spent more than an hour there.

Rudraprayag was as urban as any other town on Alaksnanda. It did not interest me. What interested me was the river. Here Alaksnanda met her little playful sister Mandakini. The former came from Badrinath, the latter from Kedarnath. As usual the confluence was named prayag. Mandakini lost her identity to her elder sister Alaksnanda. The clear waters got lost in the muddy ones.

We resumed our journey along the bank of Mandakini. Our road followed her to her source Kedarnath. It was past noon. And it became cloudy and visibility was reduced. We passed by the townships of Agastmuni and Kund and came to a real hairpin bend climb. Once in a while we saw snow-covered peaks, but the view was not clear. We reached Guptkashi. It was the end of the climb. The bus had climbed more than 2,000 feet after leaving Kund. But, we had missed a lot on the way on account of the weather. When the bus stopped the pilgrims ran out to restaurants to eat. But before they could make it to the hutsments rains lashed out. We remained in the bus. We were waiting for the 'gate pass'. From now on the traffic was one way in a convoy and the gate was not open.

The convoy got ready. Our bus took its position. The gate opened. The procession moved. The road was wet and progress was slow. We were on a plateau. Certainly we were going up, but the ascent was gradual and insignificant. What gripped my attention was the terrain and rains. From the window I could see a deep canyon. Mandakini was there as a narrow stream. The entire region between mountains was filled with forests. The growth was not alpine nor deciduous. It was mixed, irregular and utterly wild. The rain waters were rushing down the gullies, giving the impression of temporary water-falls. And when sun-rays fell through gaps in the clouds the valley brightened up. Mandakini, way below, sparkled. Water-falls became milkier. We went through Phata, then through Rampur and Sitapur. The whole course was zigzag. We came to Sonprayag, our terminal point. The bus stopped. We got down and collected our baggage as usual. Once again the problem was to find a room for the night.
My mother was dead tired. We had been in the bus for more than 13 hours. I made her sit on a nearby wooden bench. Leaving the baggage in her charge, I went in search of a Travellers' Lodge. It was away on a mountain. The climb was beyond her strength. So I returned. I explained the situation to my mother. We hired a chatti with other pilgrims with whom my mother had made friends. A woman was there to give her company. For the first time, we spent a night in a chatti. I made a bed for my mother. The floor was uneven but, I made it as comfortable as I could in the circumstances. My mother lay down to rest and I went out to make arrangements for the next day's trek.

This time I had decided to be careful in selecting the 'kandiwala'. I was looking for a strong person who could carry my mother with ease. I contacted the government agency and discussed my requirements. They asked me to present my mother before them. I told them that my mother was more than 72 years old and was just a bundle of bones and skin and could hardly weigh more than 35 kg. But they would not believe me. I had to go back to the chatti and fetch my tired mother before them. They were satisfied. They gave me a hefty man, and a memo. I paid them the advance and promised to pay the balance on my return journey. The matter was settled.

Before returning to our chatti, we went to eat our usual fare: rice, potato and gram soup. This was the staple food in this region. We ate what we could and returned to the chatti. In the neighbouring chatti there was a quarrel for space. My mother went to sleep inspite of the din. I waited for the din to subside and began my diary from the point I had left off. But it was impossible to write and I too went to sleep.

May 29

It was another beautiful, cool Himalayan morning. Nearby Mandakini was roaring mightily. She was leaping over rocks to embrace hastily her sister Son. This confluence became Sonprayag. The fall in the woods was a lovely sight. Our spirits soared. But this elation did not last long. When we came out of our chatti, leaving behind the unwanted baggage, we did not find the 'kandiwala' promised to us the previous night. Instead there was an old sickly man. This was a real blow. But we were helpless and could do nothing except express our anger and displeasure. There was no time to lodge a complaint with the government agent. Besides, we were not sure if the complaint would be redressed. We accepted the situation. My mother sat in the 'kandii'. I walked ahead with my staff in my hand and the rucksack on my back. We were indeed sad. But I asked my mother to cheer up and not to miss the beautiful surroundings.

We began our trek by crossing a new strong bridge over Son. Taking a short cut we came to a jeepable road to Gourikund which was more than 5 km away. Kedarnath was 19 km from here. The road was cut along the side of a mountain. To my left was the tall wall of the mountain; to my right was the ridge falling into Mandakini. She was rapidly roaring down through a gorge. Her banks were lined with tall trees. The forest on all sides was dense, wild and irregular. The growth was a mix of deciduous and alpine.

Like all mountain roads, the road zigzagged around the mountain. The gorge was turning round to my left. It was a wonderful walk. My mother too walked as much as she could. She did not have much difficulty since the gradient was 100 feet a kilometre. When we reached Gourikund we had climbed just about 400 to 500 feet.

The hot springs at Gourikund were comparable with those at Jamnotri. My mother and I bathed there. Before leaving the place, I dried the clothes. My mother
performed her 'puja'. Today was her day for fasting according to the Indian calendar. I ate 'jalebi' and boiled gram. We were ready for our onward march. I called our 'kandiwalla'. We came out of the bazaar on foot and were right on the bank of Mandakini. From here our steepest ascent began. My mother sat in her 'kandi'. We set out.

The distance from Gourikund to Rambada were a mere 6 km. But these were no ordinary kilometres on a jeepable road. From now on we walked along a narrow bridle-path, ascending without respite. Mandakini remained far below in a deep canyon. Her waters were hardly visible, though her presence could be felt, separating our mountain-range from the next. We panted but continued to climb. Every hairpin bend renewed our determination. The ascent at times was about 500 feet a kilometre. We rested as often as necessary, choosing pleasant spots. From one such spot we saw a snow-covered peak in the midday light. There were countless slopes of mountains covered with dense growth. There was not a gap in this green carpet. I stood breathless for a moment at the edge of a deep canyon. The mountain opposite, with its beautiful line of conifers, stood silent. It was the most unforgettable picture my eyes photographed. It was wilderness at its best. I resumed the climb. Rambada was yet a couple of kilometres away.

When we reached Rambada lightning was streaking across the sky. At once I knew of impending bad weather and rains. We decided to spend an hour or two in the chatti. I was sure that the weather would clear by that time. I gave my mother 'ukala' and asked her to take as much sweets and sugar as possible. That was the only way she could keep her strength on a fasting day. It was raining outside. I sat down on a wooden plank trying to figure out how much time it would take to reach Kedarnath and how we would cover the distance. One thing was certain; we would be slowed down considerably. It would be night by the time we reached. I was a bit worried about my mother but could do little except wait and watch the weather.

After an hour or so the rain stopped. We came out. The path was muddy and slippery. The mud stuck to our soles. It was not pleasant to walk. Carefully we made our way up. There was still a long climb. For our 'kandiwalla' it was very difficult. He was panting all the time. He rested often. And it was torture for us to watch him. My mother felt guilty. I too accused myself for failing once again to get a stronger man. I lost interest in the surroundings. Only one scene could not escape my notice. From the canyon below came a gush of wind. Clouds, like heaps of cotton, followed, enveloping us in no time. Visibility came to zero. But the next gush of wind carried away all these fluffy clusters in a matter of minutes. It was simply magical.

We were now well above 10,000 feet. All the nearby mountains were snowcovered. The ice crust was thin and melting snows filled the gullies, and came down. We could have touched the snow but the gullies were a little away from the bridle-path. When we finally made it to the top we stood at 11,760 feet above sea level. We were yet some 2 km away from our final destination Kedarnath. We could see it in the distance. We were now on an open flat ground. At its end stood the Kedarnath temple; above it the massive Kedarnath peak. To our right was a snow-covered range of mountains. To our left were a few tall hillocks. Among them was a snow-bound mountain. Our bridle-path was in the middle and led more or less straight to the temple. It was easy for me to walk on a level ground. But for our 'kandiwalla' it was no joke. He sat down every now and then. It was getting dark and unbearably cold for my mother. In such a state we reached Kedarnath. It was pitch-dark and I was not sure how I would fix a place for the night. Then I heard three English-
speaking men coming down a slope. I stopped them and spoke to one of my difficulties. He took me to the Kali-Kamlwala Dharamsala and managed to get a room. Our 'kandiwala' had not followed us because he could not negotiate the last slope without rest. The man went back and brought them to the Dharamsala. My mother could hardly speak a word. I lifted her out of the 'kandi' and set her near a fireplace. I massaged her hands and feet. She revived in a few minutes. I took her to our room. She sat on a comfortable chair, but there was no fireplace in the room. To conserve her body heat recently gained from the fireplace, I quickly made her bed on a cot which was utterly out of shape. I made her put on her gloves and socks and wrapped her in a shawl. When she lay down I covered her with blankets. Yet I was not sure that it was enough for the cold at night. So I went out and hired a thick quilt. I piled it over the blanket. I was satisfied. I sat down on a chair and relaxed. After sometime I spread my sleeping bag on the floor and went to sleep.

May 30

4 a. m. It was still dark when I came out of my room. I got up early because I wanted to get ready before the other pilgrims woke up. I went down to a water-tap. The water was ice-cold, yet I finished my morning ablutions and returned to my room. It was then twilight. The golden beam of light had just surfaced the Kedarnath massif. I helped my mother out of her bed and brought her in her wrappings to the road. We stood there facing the holy Kedarnath. The golden beam went up. It touched the tip of the Kedarnath peak. It lighted it to an incandescent yellow, as if an unknown hand had just switched on a 10,000 watt sodium lamp. The beam broadened, and with it the light touched the entire downward crest, igniting each tip on its course to a bright yellow. In no time dozens of sodium like lamps lit up, lighting the wide panorama. The beam now touched the tip of a lower peak on our left and then one farther away on our right and the spectacle was repeated. It was a magnificent sight, perhaps once in a life-time. My mother was visibly moved. She commended me for having dragged her out of bed in the cold. We stood motionless for minutes. We watched the sun-god perform his morning 'puja'. Now the rays were brighter and we went back to our room. I asked my mother to sleep until it was warm and sat down to write my diary.

At about 7 a. m., when I came out of my room, I saw the pilgrims going to the temple. When I asked one of them about the opening time of the temple, he replied that the temple opened at 6 a. m. for those who paid 'dan' of more than Rs. 51. At 8 a. m. the rest were allowed to visit it. I decided not to enter the temple.

At about 8 a. m., after paying an exorbitant price, I obtained some hot water for my mother. She washed and changed and was ready to go to the temple. When we reached the temple I saw a long queue of people, circling the temple twice over. I did not know how my mother would stand the ordeal of standing in the queue in such cold. I requested a couple to take my mother along with them. They said that the volunteer who supervised would object. He did come running. But I told him point blank that I was least interested in going into the temple even if he paid me a million rupees. I told him that this kind family would take my old mother in. Seeing my mood none objected. My mother was 10th or 15th in the line. I relaxed and watched the temple from the outside.

Kedarnath temple is situated on a high plinth. The temple is small and well-proportioned. Its shikhar is not tall but is in good shape. The portico is Greek in conception. The inside is empty and dark. It consists of a huge black rock which pilgrims worship. In the background is the Kedarnath massif, which lends the temple its majesty.
My mother came out of the temple with the 'prasad'. I made her sit in the sun. From a shop below I bought 'penda' for her to break her fast. It was a Monday and she would eat only once. But 'penda' would do.

It was now past 10 a.m., time to hurry down. My mother paid 'dan' to the Dharamsala and we started. It was sunny and the going was smooth until we reached Rambada. But then the usual "afternoon weather" developed. First a minor hailstorm touched us; the stones were small and not heavy. But then it began to pour. Fortunately, we were in a chatti and did not mind the heavy downpour. But it did hamper our progress.

We spent an hour or so in the chatti. The weather was not yet clear but we decided to walk in the drizzle. Walking in the mud was not easy. We had to watch each step and could not enjoy the scenic beauty. Occasional rain hindered our progress all the way down until we reached Gourikund.

Once again, we were on the bank of the lovely Mandakini. Her crystal clear waters were cascading down the same narrow gorge. The jeepable road was not muddy. It was pleasant to walk. The luxuriant forest shaded the path from the evening sun. The birds flew past in haste. And we reached Sonprayag in high spirits.

There were two hours of daylight left when we stepped in our chatti. We collected our belongings and moved to another chatti as ours was overcrowded. There we made preparations for the next day's journey.

Our new 'chattiwala', a man with pleasing manners, was always ready to help. He gave us useful hints. I bought our tickets for Badrinath without any difficulty. And now I was free from all anxieties. We took our meals with our new 'chattiwala', paid him in advance and went to sleep.
May 31

6 a.m. Our bus was going slowly in a convoy. Before us was a cloudless sky. Its blue was conspicuous. A beautiful snow-covered range appeared at Sitapur. A wider view of it was possible at Rampur. Just before Phata, this range broke into three because of intervening forest covered mountains. The range close to me had three peaks forming a triangle. They shone brightly in the sun. Below was the canyon thickly wooded. Mandakini flowed in a thin stream. Her waters sparkled occasionally in the sun. We reached Guptkashi in a happy mood.

From Guptkashi to Kund was a steep descent which our bus negotiated with ease. From Kund to Rudraprayag we retraced the same road. We crossed the bridge at Rudraprayag. We did not go into the town but turned to our left. We sought now the banks of Alaknanda. The road meandered along the river to her source.

Some time after leaving Rudraprayag, we came to a point from where Trisul, the famous Himalayan range, could be seen. I saw a smooth white surface enveloped in a heap of clouds. The view was not distinct. Hardly, could I say that I saw Trisul.

The road was newly built and in excellent condition. The traffic was heavy. Most of the time it was army trucks driving carefully. A mistake could be fatal. We touched Karnaprayag, where the Pindar river coming from the Pindari glacier met Alaknanda. Then came Nandaprayag, where Nandakini embraced her elder sister Alaknanda. Further on, we crossed Chamoli and then Pipalkoti. All towns were more or less urbanised on this route. There was nothing much to take notice of. The region was much more developed than I had expected.

Close to Joshimath the real climb began. Alaknanda was receding in the background. We must have climbed 2,000 feet. When we reached Joshimath the altitude read 6,150 feet. We were in time for the 'gate pass'. Our bus took its position in the convoy and we waited for the convoy to move.

Joshimath is the winter headquarters for the idol of Badrinath. The priests and residents of Badrinath come down to Joshimath after Diwali and spend their winter months here. It is also a seat of one of the Shankaracharyas.

Our convoy moved. When it took a sharp turn we saw Alaknanda far below. We went down a steep slope. Once again, we took a sharp turn. We faced now a deep valley below. The road passed through army camps. When we had descended more than a 1,000 feet, we came to a bridge on Alaknanda. The road ran along the bank of the river. After some distance we turned to our left and entered a gorge. Alaknanda with her muddy waters was just flowing down. After an ascent of a few kilometres we came to Govind Ghat. Our bus stopped here.

Govind Ghat is situated in a narrow gorge. All around are the vertical walls of the mountains. The road and the river bed below spanned the gap between the precipices. On one precipice, on the farther bank of the river, was a vertical ladder, painted white. Perhaps pilgrims used it to go to Hemkund or the Valley of Flowers. The hanging cliffs were simply awe-inspiring.

Once again our convoy moved at a snail’s pace. The gradients were becoming steeper but were nothing compared to ones yet to come. We passed by Pandukeshwar and the breath-taking ascent began. The road was winding up. And came hairpin bend ascents, not one, but three in quick succession. These were also in the span
of a gorge. Melting snows from nearby precipices ran down and reached the silt-charged waters of Alaknanda. Ravines were so close by that we could see water-falls running down the thin crusts of snow. The trees were scant. A thin line of short conifers was seen on the crest of a mountain. The scene was rugged, the road was a marvel of engineering.

In awe and wonder, we came to the end of our climb. A wide valley opened before us. In the distance was Badrinath (10,350 feet above sea-level). Our road led us there. Our bus stopped outside the town. We got down in an open quadrangle. Collecting our baggage we walked down to the town. The temple committee office was in a South Indian Dharamsala at an elevation. We went there. My mother had some difficulty going up, but it was not yet cold. We waited in the office for someone to attend to us. We managed to persuade someone to let us spend a night in the office.

The office was in a modern building. The Dharamsala was built only a couple of years earlier. The room which was not meant to be an office, but a shop, had a rolling shutter in the front and a small door at the back. In the backyard were bathrooms and other amenities. Hot water was not available. Also, there was no fireplace. Anyway the day was not too cold and my mother was not uncomfortable. For the night I hired a clean warm quilt for her. I had ample bedding in my rucksack. But we had to wait until the office closed.

It was a moonlit night. I placed a chair in front of the room for my mother. I stood near by. Before me was a wall of low mountain-range. Behind it were 'Nar' and 'Narayan' mountain peaks. Far behind was the shapely peak of Nilkanth. All shone beautifully in a clear bright sky. The effect was silvery white. To the right were some more peaks whose names I did not know. They too shone in the same light. We went to the backyard from where we could see another mountain-range. It was low and quite close by. The snowfall on this range was scant. The black of the rock contrasted beautifully with the white of the snow. Both stood out in the moonlight.

I closed the shutter, made the bed on a carpeted floor. My mother made herself as comfortable as she could. I sat on a chair under an electric lamp. I wrote a few pages of my diary and then went to sleep.

**June 1**

I overslept today. When I got up it was past 5.30 a. m. I missed the morning view which made me sad. But there was no point in brooding over it. I went out to the backyard, washed myself and got ready for the day. My mother too got up. Since we were in an office I wanted to pack my rucksack before it opened for the day. I brought her some hot water for a wash. She got ready and sat on a chair waiting for the temple to open.

We walked down the slope to the river. The morning was bright. It was past 8 a. m. We came upon a bridge on Alaknanda. We stood midway on the bridge and watched the silt-charged waters flowing below. We came to the other bank which had hot springs just as in Jamnatri and Gourikund. My mother took her bath in one of the 'kunds'. I washed the clothes and later took my bath. I dried the clothes and my mother took rest in a place nearby. The temple was not too far from this place. But it was overflowing with people. I advised my mother to go there later.
At about 10 a.m. a 'panda' (priest) who met my mother at the bus stand found her out. He would not leave her for a moment. My mother too got tired of him. She said to me, "Let him have a few rupees". She told him, "Let us go to the temple".
I saw my mother climbing the stairs of the temple with the 'panda'. The doorway was two flights above the street level. It was impressive and richly ornate. The two balancing side wings gave prominence to the front portico. The decoration of the whole structure was in a mixed style: partly Jaipur, partly South Indian. The portico in particular attracted attention. It had both grace and poise. But the whole temple was lost in the crowded ugly huts on the slopes of the hill. Its sides were hardly seen. And, perhaps there was nothing behind it. It was a temple without the atmosphere of a temple.

My mother came down with the 'panda'. She was a little agitated. She said, "This panda hindered me in 'puja'". His eyes were on the money in her hand. He wanted my mother to spend Rs. 2 only on her 'puja' and on other priests. The rest he wanted for himself. My mother refused and she did what she wanted.

I got furious with the 'panda' and his greed. I gave him three or four rupees which I had in my pocket and told him to pack off otherwise he would land in a police station.

There was nothing that we could do in Badrinath. It was overflowing with the people all the time. We ate our lunch in a hotel and decided to return.

Around 2'0 clock I made my way to the ticket window. I asked for the tickets for Rishikesh. I got no response. The tickets were sold out in lots. Those who were in a bigger group got tickets easily. I waited there in confusion, not knowing what to do. At last, it so happened that a bus had two seats vacant, all others being booked by a group. We were accomodated in this group somehow. We got our two tickets. We reached the bus and squeezed ourselves in.

Around 3'0 clock the bus moved in a convoy. We sped down that marvel of a road. When we reached Joshimath, it was not yet dark. Our driver decided to call it a day at the next stopover, Pipalkoti. We reached Pipalkoti around 6 p.m., and camped there for the night in a chatti.

June 2

Before daybreak our bus started again. We were retracing a distance of more than 110 km along Alaknanda. We reached Srinagar at noon. From here, the road was unfamiliar, although it continued along the same river. My interest revived. The track was new. But nothing noteworthy came our way. The same river, the same terrain. We reached Deoprayag when it was really warm. Here, from a height, we saw the confluence of Bhagirathi with Alaknanda. The two torrential streams embraced each other. Their waters mingled to form the holy Ganga. Now our road meandered along the most revered river Ganga—Ganga, life of the Indian people.

Our bus did not stop at Deoprayag. And we passed terraced fields. The region was dry and the rocks and mountains barren. At times we were going up, but sometimes we came down. But we never touched the river. The day was getting warmer and the passengers were becoming thirstier. There was no water around. There was no water even to cool the motor engine. Not that the water was scarce. It was there in plenty, but it was far below in the river. And, there was no way to reach it. I watched with joy the beautiful Ganga flowing placidly between the gaps of high hills. From a height I could see countless logs floating down the river. Some were entrapped on the banks; others were majestically moving down with the current. It was enchanting to watch them float. I followed their course with lively interest.
By now the pilgrims became angry. They were rightly accusing the bus driver for not having stopped at Deoprayag. But their outburst was untimely. We had just entered the shaded mountains, about some 30 km away from Rishikesh. The forest was the same one which we had seen while leaving Rishikesh. The bus went rapidly down the road. It was clear that we would find water as soon as we reached down. And indeed we sighted a brook the moment we touched the lowest level in a thickly forested valley. Our driver let out his thirsty passengers. The place had a few huts and a couple of shops. The passengers refreshed themselves and did not think of continuing their journey for the next half an hour.

Once again our bus was going up. The road through the shaded mountains was pleasant. The river below shone in the afternoon sunshine. The view of her from shaded woods was charming. This was our last climb. The moment we began our final descent, Lakshman-jhula, with its famous suspension bridge, was seen in the distance. Ganga below was dignified and becoming ever expansive. The pilgrims recognised the buildings on the farther bank and began to name them one after the other. In that happy mood we reached Rishikesh, our starting point.

I could see joy lit on my mother's face. She was tired and her face wrinkled, creased more due to fatigue. Yet her eyes shone. She was more relaxed. She felt the deep satisfaction of having completed the pilgrimage which was far beyond her strength. What sustained her was her will and faith. I was rather sad. My sojourn in the Himalayas, 12 days in all, was too brief; my acquaintance with them too scant. Yet, I too felt my mother's joy and satisfaction. I had at least fulfilled her only wish.

Blue is the sky
Air is cool and crisp
Conifers adorn the hill-sides
Steep slopes fall into streams
I make my way all alone
Along the bank of a winding river
At each turn of which
I stop, breathe and rest
A little poise — thereby I gain
Certainly, precarious is my journey
But spiritual equilibrium I derive
This is how I remember
My sojourn in the Himalayas.
PART II
TOPOGRAPHY
OF
THE HIMALAYAS
श्वेत सुदर
हिमालयाँदित धरणी
सुमधुर शांत
हिम आभारित
वृक्ष वने
सूर्यकिरण रचे
अनुपम गान

White, beautiful
Snow bedecked land
Sweet and tranquil
On snow-covered
Trees and forests
Sun-rays play
Unfathomed songs
1. THE HIMALAYAS

In the first part, we spoke of three zones of the Himalayas — the Great Himalayas, the Middle Himalayas and the Outer Himalayas. We must admit now that it was a simplistic approach to a very complex tangle of mountains and we now elaborate upon our earlier description. With this in view, we present two maps which illustrate the Himalayas in their entirety.

MAP 1. HIMALAYAN AND CENTRAL ASIAN RANGES (AFTER BURRARD)

This map was published in 1907 and is based on data collected in the last century. Since then, all-round progress has taken place in science and technology and better maps are available, however, these are not for free use.

The above map shows the famous Pamir knot, from which diverge the various mountain ranges of Asia. Of these, the Hindukush, the Karakoram and the Kailas, more or less, separate the Indian sub-continent from the rest of Asia. The rivers Indus and Brahmaputra mark the watersheds.

Map 2 (p. 32) is an enlargement of the north-west section of Himalayan ranges and shows them in better perspective. We shall frequently refer to these maps and the reader is advised to study them in detail.

Having roughly delineated the boundaries of the Indian sub-continent, we now proceed to explore some of the Himalayan ranges. Our exploration is on paper and does not involve any risk or danger. We are not mountaineers and do not require
elaborate details. Rather, a broad knowledge of these mountains would serve our purpose. We begin with the peripheral ranges – the Hindukush, the Karakoram and the Kailas.

MAP 2. THE NW HIMALAYAS. The Murree-Siwalik outcrop indicates the great flexure around the concealed Peninsular Block; Courtesy Chambers’s Encyclopedia.2 The map, though recent, is of pre-sputnik days.

The Hindukush Range

The major part of this range lies in Afghanistan. Only a part of it is in Pakistan and the region is known as Chitral. The place is well-known because the highest mountains of Hindukush are located here. The names of some renowned peaks are:

<table>
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<tr>
<th>Peak</th>
<th>Height</th>
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<tbody>
<tr>
<td>Tirich Mir</td>
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</tr>
<tr>
<td>Noshag</td>
<td>7492 Metres</td>
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<tr>
<td>Istor-O-Nal</td>
<td>7403 Metres</td>
</tr>
<tr>
<td>Suraghmar</td>
<td>7349 Metres</td>
</tr>
</tbody>
</table>

The heights are taken from a map,3 in a recent book the height of Tirich Mir is 7579 metres/24,863 feet.4 1m = 3.281 feet.

These four peaks are highest among the ten which rise above 7,000 metres.
The beauty of Hindu Kush mountains is noted by many travellers. It is mainly compared with the mountains of Caucasus in Russia. The climate of Chitral is dry and very good for health. People here, as in Caucasus, live easily up to hundred years. They are hardy and their habitat barren and rocky. The high peaks are capped with snow which feeds small glaciers and streams. Meadows and flowering plants along the rivulets add to their overall charm.

The Karakoram Range

This is a mighty range some 480 kilometres or 300 miles long. It forms a formidable barrier, something like a natural fortress, which separates Kashmir from the Chinese province of Sinkiang. Mount Godwin Austen, popularly known as K2 (K-two), is the highest peak in this range and is second only to Mount Everest which is in the Great Himalayas. In all, there are nineteen peaks which are above 7,600 metres (24,936 feet). Four of them are above 8,000 metres (26,248 feet). This lofty range has a large number of long glaciers, a phenomenon which, among the world’s mountain systems, is peculiar to the Himalayas. Some of the largest glaciers of this region from west to east are: Baltura (58 kilometres/36 miles), Hispar (61 kilometres/38 miles), Bafio (59 kilometres/37 miles), Baltoro (58 kilometres/36 miles) and Siachen (72 kilometres/45 miles). The last one which is the longest is very close to Ladakh. The others are in the Pakistan-occupied part of Kashmir. Among these, Baltoro is unique. It is surrounded by a cirque of high mountains which include K2. The fantastic shapes of boulders and cliffs have made this region famous.
FIG. 2. K₂ AND THE BALTORO MUZTAGH

Some of the important mountains of the Karakoram range are listed below:

<table>
<thead>
<tr>
<th>Peak</th>
<th>Height</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Godwin Austen (K2)</td>
<td></td>
<td>Baltoro</td>
</tr>
<tr>
<td>Gasherbrum I (K5)</td>
<td>8068</td>
<td>Baltoro</td>
</tr>
<tr>
<td>(or Hidden Peak)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gasherbrum II (K4)</td>
<td>8034</td>
<td>Baltoro</td>
</tr>
<tr>
<td>Gasherbrum III (K3a)</td>
<td>7952</td>
<td>Baltoro</td>
</tr>
<tr>
<td>Gasherbrum IV (K3)</td>
<td>7924</td>
<td>Baltoro</td>
</tr>
<tr>
<td>Broad Peak II</td>
<td>7930</td>
<td>Baltoro</td>
</tr>
<tr>
<td>Disteghil Sar I</td>
<td>7884</td>
<td>Hispar</td>
</tr>
<tr>
<td>Masherbrum East (K1E)</td>
<td>7821</td>
<td>Masherbrun range in lesser</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Karakoram</td>
</tr>
<tr>
<td>Masherbrum West (K1W)</td>
<td>7806</td>
<td></td>
</tr>
<tr>
<td>Rakaposhi (U49)</td>
<td>7787</td>
<td>Rakaposhi range in lesser</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Karakoram</td>
</tr>
<tr>
<td>Peak</td>
<td>Height Metres</td>
<td>Height Feet</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Hunza-Kunji I</td>
<td>7784</td>
<td>25,540</td>
</tr>
<tr>
<td>Kanjut Sar</td>
<td>7760</td>
<td>25,460</td>
</tr>
<tr>
<td>Saltoro Kangri I (K10)</td>
<td>7742</td>
<td>25,400</td>
</tr>
<tr>
<td>Hunza Kunji II</td>
<td>7709</td>
<td>25,294</td>
</tr>
<tr>
<td>Saltoro Kangri II</td>
<td>7705</td>
<td>25,280</td>
</tr>
<tr>
<td>Disteghil Sar II</td>
<td>7696</td>
<td>25,250</td>
</tr>
<tr>
<td>Saser Kangri (K22)</td>
<td>7671</td>
<td>25,170</td>
</tr>
<tr>
<td>Chogolisa I (K6)</td>
<td>7653</td>
<td>25,110</td>
</tr>
</tbody>
</table>

The values under the column 'feet' are taken from an appendix. Some authors' value for Broad peak is 8,047 metres or 26,402 feet.

This is by no means a complete list. There are other mountain peaks which are famous but are not included e.g. Haramosh (7,397 metres/24,270 feet). Readers who wish to know more about this range should consult Kenneth Mason's article 'Karakoram Nomenclature' where some 240 peaks are listed which rise above 6,095 metres of 20,000 feet.

The crest-zone of Karakoram seldom goes below 5,500 metres (18,046 feet) and often rises to 7,000 metres (22,967 feet). The splendour of this range lies in its lofty peaks, mighty glaciers and innumerable small lakes. In India, it occupies the highest latitude, and hence, its climate is almost European. In the past, on this account, the region became a happy ground for European exploration.

The Kailas Range

This range is entirely in Tibet. Its highest point is Mount Kailas (6,791 metres/22,280 feet), from which the range derives its name. The lakes, Mansarovar and Rakshas Tal, which are supposed to be interlinked are to its south. The rivers Indus, Brahmaputra, Sutlej and Karnali, have their sources in this region (See Maps 1 and 2). The last one becomes Gogra in India and meets Ganga just near Patna in Bihar.

Indians have an attachment for this range because Hindus regard Mount Kailas as the abode of Shiva and Mansarovar as the holiest place of pilgrimage. Many religious Hindus have, year after year, braved their way to this remote inaccessible place.

We leave the peripheral ranges and come to the main ones which are in India, Nepal and Bhutan.

Once again, we refer to Maps 1 and 2. The Ladakh range rises in the Ladakh province of Jammu and Kashmir and goes on to Tibet. The range is not famous and has not attracted many mountaineers. Of interest is the famous river Indus, which flows from east to west along the range and cuts through it twice — once, from north to south, after it has flown between the ranges of Ladakh and Kailas, and the second time from south to north, when flowing past Leh and approaching Skardu. The course of Indus is more tempestuous than that of Brahmaputra which flows from west to east and goes past various ranges placidly.
The rivers Indus and Brahmaputra, after coursing along the northern ranges, take a sudden southward turn. The bends they make are seen in Burrard's map. Between these two bends is enclosed the range of Great Himalayas, which is some 2,400 kilometres or 1,500 miles long and 240 kilometres or 150 miles wide. We may say that for its crest-zone it has an average elevation of 6,095 metres or 20,000 feet. At the western end, the mighty peak of Nanga Parbat (8,126 metres/26,660 feet) overlooks the Indus bend and at the eastern end the sentient peak of Namcha Barwa (7,756 metres/25,447 feet) gazes on the Brahmaputra bend. It is this — a giant among the world's mountain ranges — which captivates our mind and heart. That is why it is called the Great Himalayas. We will focus our attention on it because it is of principal interest to us. However, before we take up its study, it is advantageous to acquaint ourselves with its subsidiary ranges — the Zaskar, the Pir Panjal, the Dhauladhar and the Siwalik. Some of the smaller ranges like the Pir Panjal and the Dhauladhar are called the Lesser Himalayas. We are marginally concerned here with all of them and it will help us to remember their odd names for ready recollection later.

To the north of the Great Himalayas is the Zaskar range. Zaskar is spelt sometimes as Zanskar also. A feeder of the Indus arises in these mountains and carries the same name. The range is not an ordinary one. At places, it overshadows the Great Himalayas. That is, the peaks of Zaskar range in some areas tower above the nearby peaks of the Great Himalayas. To cite an example, we mention the Karam region near Badrinath. This and a few other places are exceptions. On the whole, this range remains hidden behind the Great Himalayas and is scarcely seen from the hill stations of the Lesser Himalayas. One gets the impression that there is nothing behind the giant range. But this impression stands to correction when one crosses the Great Himalayas and gazes in awe at the peaks of the Zaskar range.

From Burrard's map we infer that the Zaskar range merges with the Great Himalayas somewhere in Nepal. That this inference is partially correct comes from Kenneth Mason's book, 'Abode of Snow.' According to him, the Zaskar range in Nepal does come very close to the Great Himalayas, however, the former merges with the latter only at some places and elsewhere maintains its separate identity. The interesting point is that whenever these two ranges coalesce, the crest-zone of the Great Himalayas rises to dizzy heights. Mount Dhaulagiri is one such peak.

The Pir Panjal range is a short one and is said to belong to the Lesser Himalayas. It is situated south of the Kashmir valley and runs across a little towards east and joins the Great Himalayas. In winter it cuts off the beautiful valley of Kashmir from the rest of India.

The Dhauladhar range is situated to the south of Pir Panjal range and comes under the Lesser Himalayas. It rises near Udhampur in Jammu and by-passes the hills north of Simla to meet the Great Himalayas at Mount Badrinath (Chaukamba). As it comes closer to the Great Himalayas, its crest-zone rises and among the notable peaks is Kedarnath.

A less known range of the Lesser Himalayas is the Nag Tibba range. It rises a little further south and runs right from the Simla Hills down to the Great Himalayas near about Mount Dhaulagiri.

On the whole, the Lesser Himalayas, barring their proximity to the Great Himalayas, undulate between 600 metres (1,969 feet) and 3,000 metres (9,843 feet).

The Siwalik range, as shown in Burrard's map, runs parallel to the Great Himalayas all the way from west to east. Of course, there are some gaps in it,
which are due to vigorous monsoon erosions. Such gaps are known in Hindi as 'duns'. One well-known gap is Dehradun. The other gap near Tista in the east, although a dun, is not so known because it is 320 kilometres (200 miles) wide. Here, the entire range is totally washed out and the Great Himalayas directly face the Indian plains. The overall range is of low altitude and its elevation varies from 600 metres (1,969 feet) to 1,200 metres (3,937 feet).

After this brief introduction of subsidiary Himalayan ranges, we deal with the Great Himalayas.

THE GREAT HIMALAYAS

The genesis of the Great Himalayas is taught all over the world in schools and colleges. If I repeat it here, it is to make a point. That some 50 to 100 million years ago it rose from the bed of a pre-historic ocean called Tethys; that it is the highest and the youngest mountain chain of the world; that it is still rising — all these facts are too well-known. What is not so well-known is the fact that in these post-sputnik days, no careful experiments are planned to measure its rise accurately. No doubt, there are some estimates for this rise and these are publicized. But when the heights of peaks themselves are in doubt, what to make of a few metres rise over a period of a century?

The Great Himalayas are a long chain which is sliced into big or small segments by the stupendous river gorges carved out by the tributaries of Sindhu and Ganga. It contains 31 peaks whose altitude exceeds 7,620 metres (25,000 feet) — 12 of which rise above 8,000 metres (26,248 feet). Its axis and crystalline core are composed of 'intruded granites and sedimentary rocks' and its crest, barring the river gorges and well-known passes, rarely falls below 5,500 metres (18,046 feet). The magnificent massifs along its crest-zone are:

<table>
<thead>
<tr>
<th>Peak</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metres</td>
</tr>
<tr>
<td>Nanga Parbat</td>
<td>8113</td>
</tr>
<tr>
<td>Nanda Devi</td>
<td>7816</td>
</tr>
<tr>
<td>Dhaulagiri</td>
<td>8167</td>
</tr>
<tr>
<td>Annapurna</td>
<td>8074</td>
</tr>
<tr>
<td>Mount Everest</td>
<td>8839</td>
</tr>
<tr>
<td>Makalu</td>
<td>8470</td>
</tr>
<tr>
<td>Kangchengzonga</td>
<td>8578</td>
</tr>
<tr>
<td>Namcha Barwa</td>
<td>7755</td>
</tr>
</tbody>
</table>

Naming of some well-known peaks and recording their heights does not give any idea of the grandeur of these mountains. Only mountaineers who have climbed in different regions of the world know how awe-inspiring the Great Himalayas are. Swiss guides and climbers who accompanied the early European mountaineers were the first to recognise the immensity of this incomparable creation of nature. They often compared the Alps with the Himalayas and were impressed by the latter's majesty. To readers who have neither seen the Alps nor the Himalayas, it is impossible to give an idea of the mountain world. Figure 3 may prove useful to the readers to obtain a rough estimate of the magnificence of the Himalayas.\(^{11}\)
FIG. 3. ALPS AND HIMALAYAS. Vertical exaggeration about 20 times. K2, 8610m/28,250 feet; Kk, Karakoram Pass, 5654/18,550; NP, Nanga Parbat, 8107/26,600; ND, Nanda Devi, 7816/25,645; D, Dhaulagiri, 8166/26,795; Everest, 8882/29,141; K, Kangchenjunga 8578/28,146; NB, Namcha Barwa, 7755/25,445. Cf. Mt Blanc, 4810m/15,780 feet; Matterhorn, 4638/15,217; St Gothard Pass, 2112/6,930; Brenner Pass 1370/4,495.

The figure depicts what the great Indian poet Kalidas wrote of the Himalayas:

*God of the distant north, the Snowy Range*

*O'er other mountains towers imperially;*

*Earth's measuring-rod, being great and free from change*

*Sink to the eastern and the western sea...* 12

Such a range cannot be described casually. We have to study it systematically. For this, the segments, of which we spoke earlier, form the natural divisions: (1) the Punjab Himalayas, which are the sources of five rivers — Jhelum, Chenab, Ravi, Beas and Sutlej. The last named rises in Tibet, yet, it drains this division heavily. The region falls between the rivers Indus and Sutlej. (2) The Garhwal Kumaon Himalayas, which come between the rivers Sutlej and Kali; (3) the Nepal Himalayas, which form a political unit by itself; (4) the Sikkim Bhutan Himalayas and (5) the Assam Himalayas. There is much wisdom in dividing the range in this manner; however, the present geographical boundaries dictate a different approach; we divide the Great Himalayan range as follows:

(1) the Kashmir Himalayas; (2) the Himachal Himalayas; (3) the Garhwal Kumaon Himalayas; (4) the Nepal Himalayas; (5) the Sikkim Himalayas; (6) the Bhutan Himalayas and (7) the Arunachal (or Assam) Himalayas.

In the first four divisions, the four ranges, namely, the Zaskar, the Great Himalayas, the Lesser Himalayas and the Siwalik are represented. In Sikkim and Bhutan the Great Himalayas make a fantastic topographical adjustment which is a marvel in itself. The last division is yet to be fully explored.

Now we take each division separately.

The Kashmir Himalayas

The region is illustrated in Map 3 (p. 39). We see in it the valley of Kashmir and its surroundings between the Great Himalayas and the Pir Panjal range. To the north, beyond the Great Himalayas, lie the Karakoram and the Ladakh divisions of Kashmir. To the south of Pir Panjal range lies the Jammu division. Today, the Karakoram zone is almost wholly in that part of Kashmir which is occupied by Pakistan.

The Great Himalayan crest-zone runs south-eastwards from the Nanga Parbat massif to the Nun Kun twin, and then, continues to Himachal Pradesh. In between
these two mountains, the range carries no peaks which rise higher than 6,096 metres (20,000 feet). Some towards Nun Kun are up to 5,791 metres (19,000 feet), otherwise, they are below 5,486 metres (18,000 feet), for example, Haramukh (5,142 metres/16,872 feet), Kolahoi (5,425 metres/17,799 feet) and Kohinur (5,098 metres/16,725 feet) — all renowned peaks of Kashmir. Only at the border of Himachal Pradesh the range climbs to 6,401 metres (21,000 feet). Some high peaks of this range are listed below:

**Nanga Parbat**

<table>
<thead>
<tr>
<th>Peak</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metres</td>
</tr>
<tr>
<td>Nanga Parbat I</td>
<td>8113</td>
</tr>
<tr>
<td>Nanga Parbat II</td>
<td>7794</td>
</tr>
<tr>
<td>Rakhoto Peak</td>
<td>7074</td>
</tr>
<tr>
<td>Chongra Peaks</td>
<td>6824</td>
</tr>
<tr>
<td>Chongra Peaks</td>
<td>6446</td>
</tr>
<tr>
<td>Chongra Peaks</td>
<td>6428</td>
</tr>
<tr>
<td>Chongra Peaks</td>
<td>6608</td>
</tr>
</tbody>
</table>

39
Nun Kun

| Peak                | Height
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metres</td>
</tr>
<tr>
<td>Nun</td>
<td>7135</td>
</tr>
<tr>
<td>Kun</td>
<td>7086</td>
</tr>
<tr>
<td>Pinnacle Peak</td>
<td>6952</td>
</tr>
<tr>
<td>D 41</td>
<td>6077</td>
</tr>
<tr>
<td>Showy Peak No. 10</td>
<td>6044</td>
</tr>
<tr>
<td>D 42</td>
<td>5237</td>
</tr>
</tbody>
</table>

FIG. 5. RIDGES OF NUN KUN

40
The Pir Panjal range forms "the serrated southern rim of the lovely Vale of Kashmir". It separates the division of Jammu from the rest of the state. Along its crest-zone, there are some notable peaks, namely, Barhma Sakil (4,654 metres/15,400 feet), Parasing (4,584 metres/15,040 feet), Tatakuti (4,742 metres/15,600 feet) and Sunset Peak (4,745 metres/15,676 feet). The range is of low altitude and undulates between 4,572 metres (15,000 feet) and 4,877 metres (16,000 feet).

The Dhauladhar and the Siwalik ranges just touch the borders of Jammu. This leaves out the Zaskar range, which carries some high peaks as it passes through the sparsely populated districts of Zaskar and Rupshu; but these are rarely mentioned in the literature.

The Vale of Kashmir — "an emerald set in pearls" is formed from an ancient lake-basin some 128 kilometres (80 miles) long and 32 kilometres (20 miles) broad. Its height varies from 1,585 metres (5,200 feet) to 1,830 metres (6,004 feet). The region is well forested and its main river Jhelum which rises on the northern slopes of Pir Panjal range flows down on to Anantnag, Srinagar and Baramula — the principal towns on its bank. Then it cuts through the Pir Panjal range and enters Pakistan.

Jammu, the winter capital of the state, is close to the Punjab border. The principal river of the region is Chenab. It rises far away in Himachal Pradesh as Chandra and Bhaga and leaves its border after the Kilar township and enters in what is called Kishhtwar in Kashmir. There, it cuts through the Pir Panjal range and flows into the Jammu region. Its course is short and it soon enters Punjab.

The road to Srinagar begins from Pathankot in East Punjab. It goes to Jammu, bends round to Udhampur and heads for Anantnag. It crosses the lovely river Chenab, goes through the Jawahar Tunnel which is just below the Banihal Pass (2,732 metres/8,965 feet) in the Pir Panjal range. It touches the bank of Jhelum and follows it to Anantnag and Srinagar.

From Srinagar begins the road for Leh in Ladakh. It goes along Sind, the main feeder of Jhelum. It heads straight towards Kargil. The Pass it crosses is Zojila (3,529 metres/11,578 feet) in the Great Himalayas. Before the pass are Sonmarg and Amarnath. After Kargil, the road once again goes through a difficult pass in the Zaskar range. It turns to the well-known river Indus. Up the river it courses to Leh and continues up to Upashi where it turns round southwards. For the second time the road crosses the Zaskar range near a gorge carved out by the rivulet Zaskar. It heads then for the Great Himalayan Pass of Bara Lacha (4,938 metres/16,200 feet) in Himachal Pradesh which takes to Jispa and Keylong in Lahaul.

There are many passes in Kashmir which link its different regions. Srinagar is linked with the Gilgit region by two passes: Kamri (4,074 metres/13,368 feet) and Burzil (4,198 metres/13,775 feet). A highway is constructed between Pakistan and China. This goes through the Babusar pass (4,173 metres/13,690 feet) — a little west of Nanga Parbat. Bat Kol (or the Lonvilad pass) is 4,380 metres (14,370 feet) high. Situated between two mountain peaks as high as 5,665 metres (18,588 feet) and 5,983 metres (19,630 feet), respectively, it links the Warwan valley with Suru. Rupshu in Kashmir is linked with Spiti in Himachal Pradesh via the Parang La pass (5,578 metres/18,300 feet). There are other mountain passes too, but space does not permit us to write about all of them.

The Kashmir valley is famous for its beauty and is often compared with Switzerland. The mountains around the luxuriant valley, small for the Great Himalayas, are as high or a little higher than those of Swiss Alps. This kind of setting gives
both places an advantage: the snow zone, the tree zone and the habitation zone—all valley with fields, meadows and streams—are more or less of equal tier. They blend harmoniously into a picturesque setting whose charm captures the tourists' hearts.

I have not seen Kashmir, but have seen Mount Kenya and Mount Kilimanjaro in the East African setting. I have travelled in Austria and Switzerland and have seen Alps from the ground level as well as from the air. And, I have been to the famous Garhwal Himalayas. I can say without any hesitation that each one of them has left on me a deep but distinct impression which I find difficult to express in words.

More than 40 years ago I had seen Mount Kenya on my way from Thika to Nehri. But I had a close look from Nanyuki. I remember our drive through the wooded surrounding along a stream. Yet, the impression is of a rugged terrain, not of very high mountains. In it rose a high massif of volcanic origin, yet not crater like, but with a well-shaped sharp peak, sparsely covered with snow. The overall effect was of vast undulating space and of soaring massif looking imperially over its surroundings.

I saw Mount Kilimanjaro while driving from Nairobi to Arusha. The volcanic nature of the terrain around Arusha was evident. What I remember is a vast sparsely wooded plain in which rose a giant stupa-like dome, whose crater was filled with white glistening snow. I had a closer look when we drove to a nearby small lake which contained some large lotuses. Here too, the overall effect was of a vast plain and of a giant dome.

The Alps from the air looked like a fairyland—white snows for miles and miles, the monotony of which was broken by the successive glistening peaks.

From the ground, the Alps looked very different. The peaks took on a slight pinkish tinge. After a few thousand feet of snows the tree-line appeared. The shapely coniferous forests were a beautiful sight. They thinned near human habitations. Verdant valleys adorned by little houses in the corner of green fields and meadows on hill tops gave an aura of serenity. In the distance, meandered the crystal clear streams which sparkled in the glow of the afternoon sun. Although such scenes may exist in Kashmir, the railroads of Switzerland will not be found there. From the windows of a train are visible high snowy peaks and streams running down right below the railway track.

The mountains in Garhwal appeared totally different from what I have seen elsewhere. Tier rises over tier—and there are miles and miles of forested or barren mountains in each tier. Finally, after a day's journey, when one reaches a broad plateau like Kedarnath, some eleven or twelve thousand feet high, one still faces a snow-covered high mountain wall. One is simply humbled in its presence and retreats in awe. This is not a playground for men but a land for penance.

The Himachal Himalayas

Nowhere have the mountains inspired the artists as much as in the Himachal Himalayas. The schools of Kangra and Basohli paintings are famous all over the world and are branches of the 'Pahari' school which literally means 'Mountain' school. In these paintings the painters have captured the beauty and spirit of the Himachal Himalayas and immortalized them for ever. In the recent past, when the Russian painter Nicholas Roerich was seeking a home outside his country, he
chose a town called Naggar near Manali in this very Himachal Pradesh and painted year after year its mountains, in all splendour. This is enough of an introduction to this region.

Himachal Pradesh is a haven for motorists and trekkers alike. We give below a map which gives the mountain chains in the region.

MAP 4. THE HIMACHAL HIMALAYAS. (Drawn by the author; not to scale).

In the map, we see the Zaskar range which is on the boundary of the state. It crosses into the limits of Spiti at one or two places, otherwise, it remains outside the state borders. The pass Shipki La is its most interesting feature. In the good old days, travellers crossed over and entered Tibet. Today, the region around the pass is under army control and access is not free. Near about this place, Sutlej, which rises in Tibet, flows through a 50 kilometre (31 mile) long canyon before it enters Himachal Pradesh by carving out a gorge through this range. Thereafter, it joins its tributary, Spiti, the region's namesake. The joint torrent flows down to Pooh. Opposite the Shipki pass is the peak of Riwo Phargyul (or Leo Pargial) which is 6,781 metres or 22,250 feet high. Some 11 kilometres (7 miles) north of it is an unnamed peak (6,608 metres/21,680 feet). Shilla (7,025 metres/23,050 feet) is the highest peak in this part of the Zaskar range, though in recent times there is some dispute on this point.17,18
From Kashmir comes the Great Himalayan range, which crosses the state's boundary a little north of Kilar. There, a summit (6,142 metres/20,152 feet) stands like a lone sentinel. The range is best seen by going over its passes. Among these is the famous Bara Lacha pass (4,891 metres/16,047 feet), which allows us to go to Leh in Kashmir as well as to visit the Malung valley in Lahaul. The other two important passes are Kunzum (4,551 metres/14,932 feet) and Pin Parbati (4,602 metres/15,755 feet) which link Spiti with Lahaul and Kulu, respectively. As it continues, the range is pierced by the torrent of Sutlej south of Kalpa. Thereafter it makes its exit through the valley of Baspa in what is called the Kinnaur region.

Another range which comes from Kishwar in Kashmir is the Pir Panjal range. It enters the state south of Kilar and runs parallel to the ice-blue river Chandra-Bhaga until the rivulet Chandra turns north-west. As it approaches the Great Himalayan range, its crest-zone rises and there are many summits north of Kulu which soar up to 5,791 metres (19,000 feet). Indrasan (6,220 metres/20,408 feet) and Deo Tibba (6,001 metres/19,689 feet) are the notable ones. However, the most interesting place in the range is the Rohtang pass (4,361 metres/14,308 feet) which links Kulu with Lahaul. Somewhere east of this pass the range merges with the Great Himalayas and loses its separate identity.

The Dhauladhar range, which rises near Udhampur in Jammu enters the state south-west of Chamba where the river Ravi cuts into it. Being of low altitude it can support rich forests and was once considered the densely wooded range of Kangra. To what extent these forests flourish today I do not know, but, some 50 years ago, the coniferous forests of the state were the pride of this country. Even today, anyone who wants to see the best of deodar forests should visit Himachal Pradesh.

South of the Dhauladhar range are Dalhousie, Dharamsala, Palampur and Jogindarnagar, and north of it are Chamba and Kulu. However, the most wonderful place in the state is the knot where the northern flank of Dhauladhar impinges into the southern flank of Pir Panjal. This mountainous region is called Bara Bangahal which is indicated by a vertical chain west of Kulu and north of Jogindarnagar in Map 4. It separates the basins of Ravi and Beas. Further south-east Beas cuts through the Dhauladhar range near Larji. At Rampur, the torrent of Sutlej intercepts it. Thereafter the range makes its entry into Uttar Pradesh.

South of Himachal Pradesh is the state of Punjab, the land of five rivers. Among the rivers, Jhelum rises in Kashmir, but Chandra-Bhaga (Chenab), Ravi and Beas have their sources in the state of Himachal Pradesh. Only the longer river Sutlej comes from Tibet. And this latter river fascinates me because it is the only river in India which makes its way through so many mountainous regions and ranges.

Imagine, you are standing on a hillock near Mansarover and Rakshas Tal and gazing upon their waters. You start down the river and traverse the bleak plateau of Tibet with mountains parallel to its course. Then you stand on a mighty canyon where the floor or bed of Sutlej is some 1,000 metres (3,281 feet) below you. In this rugged terrain you continue for miles to find a lofty range called Zaskar standing across you. Climbing over the Shipki pass you come down to see the river rushing out through a stupendous gorge. A little further you see the confluence of river Spiti with Sutlej. Later, you by-pass Pooh and Kalpa and meet the high wall of the Great Himalayan range. You intercept it along with the river and reach Sarhan and think that high mountains are behind you. But Rampur awaits your arrival where once again you face a tall range of Dhauladhar. You pierce it along with Sutlej and pass through beautiful countryside before you reach the vast man-made lake.
of Gobind Sagar where at one end the river takes a leap of 240 metres (787 feet) over the Bhakra dam. Thereafter Sutlej is the pride of Punjab.

Today, the national highway, NH-22, goes from Chandigarh to Simla. A motorist misses the joy-ride of the toy-train on a narrow gauge railway line from Kalka to Simla. From here, the NH-22 continues to Theog, Narkanda and Nirth. At Kotgarh, near Narkanda, are the famous orchards of apples, and a motorist would like to visit one of them. From Nirth, the highway follows the river Sutlej right up to our border.

The rivers Chandra and Bhaga course through a picturesque setting. They arise on the opposite sides of Bara Lacha pass on the southern slopes of the Great Himalayas. The former flows south-east by the side of the Great Himalayas and then takes a sudden turn north-west and begins to run parallel to the Pir Panjal range. The latter flows straight south and meets the former at a place called Tandi. Hereafter, the river is called Chandra-Bhaga and by volume-of-flow it is the largest river in the state. Its overall setting is well described in the Imperial Gazetteer of India (1909): "[It] passes through a totally barren land where there are no signs of life, the solemn mountains clad in eternal snows lying on either bank. No villages adorn its banks, no attempts at cultivation, no signs of human life are to be met with and nothing greets the eye but the never-ending monotonous cliffs, which are lapped by the fierce stream as it rushes in wild fury against its banks."

This bleak region is also accessible today by jeepable roads right from Udaipur to Pooh. These tracks are mostly along rivers. A Buddhist pilgrim centre, Trilokinath, visited by many from Udaipur near Tandi, overlooks the Chandra-Bhaga river. At Tandi, the Simla-Kulu-Manali-Rohtang Pass-Khoksar-Keylong motorable road takes over. To the north, the road winds along the Bhaga river right near its source, where it turns to the Bara Lacha pass. To the east, it is along the Chandra river up to Khoksar. The jeepable road takes over and continues along the river and leads to the Kunzum pass. From there, the road goes to a rivulet of Spiti and meanders along it to Pooh. Here it runs into the national highway, NH-22, which leads to Simla via Kalpa, Sarhan and Rampur.

The sources of Ravi and Beas are located on the opposite sides of the Bara Bangahal knot, but these rivers do not meet each other in the state as do the rivers Chandra and Bhaga. Ravi arises on the western slopes of the knot itself, whereas, Beas arises in the Pir Panjal range on the eastern side of this very knot. These sources are not very far from the Rohtang pass. Ravi flows down westwards to Bharmaur, the ancient capital of the former princely state of Chamba, which is noted for the Pahari architecture of its temples. Further down, the river touches the township of Chamba, which too possesses several mediaeval temples but its pride is the Bhuri Singh Museum, a major repository of exquisite Pahari miniatures. Beas flows down southwards and reaches Manali, a lovely resort nestled among snow-clad mountains whose slopes are clothed with magnificent deodars. The Mountaineering Institute is located here. The river tumbles on and its tumultuous roar spreads into the beautiful countryside which is dotted with fruit orchards. In fact, most of the known towns of Himachal Pradesh adorn its banks. The motor road from the Rohtang pass winds along the river and passes through these towns. We come first to Katrain and visit its pretty orchards. Then we cross over the river and climb some 305 metres (1,000 feet) and walk into Naggar. There we see the art collection of Roerichs. Down into wilderness we wander along the river and reach Kulu. The course is now a little more south-eastwards until the river closes on to Larji and pierces the Dhauladhar range. All of a sudden Beas changes its course north-westward towards Mandi and the road leaves the river for Simla.
Himachal Pradesh, a tourist’s paradise, boasts of many hill stations. Simla was once the summer capital of India. Today, it is merely a state capital. It is reached by road from Chandigarh and by train from Kalka. Situated among the Lesser Himalayas, its elevation is only 2,206 metres or 7,238 feet. The place is too well-known to merit description. It is on the western edge of the Nag Tibba range which is not well defined and is a maze of ridges deeply scored by torrents. The highest point in it is Chaur (3,647 metres/11,966 feet) which was once an important station of the Survey of India.

At a lower altitude, there is another hill station called Kasauli (1,927 metres/6,322 feet) from where one gets a beautiful view of the vast plains of Punjab and its river Sutlej.

Way down are the Siwalik hills. On one of its isolated hillocks is Nahan (932 metres/3,058 feet). Its setting is among sprawling deep ravines covered with dense forests which once sheltered wildlife.

From Kilar if we travel southwards instead of eastwards we proceed to Chamba through the Sach pass or the Chini pass in the Pir Panjal range. Crossing the Dhauladhar range, we arrive in Dalhousie (2,036 metres/6,680 feet) — a hill station which is perched on five lovely mountains adjacent to each other. A little away is Dharamsala, now the seat of the Dalai Lama of Tibet. It is enclosed on the three sides by mountains and the southern side is open to an enchanting valley. The town consists of two parts — the upper at an altitude of 2,100 metres (6,890 feet) and the lower at 900 metres (2,953 feet). Palampur is east of Dharamsala and is known for its tea-gardens. The hydro-electric power station of the state is located at Jogindarnagar and is connected to Pathankot in the state of Punjab by a narrow gauge railway line via Kangra and Deragopipur.

All the important towns south of the Dhauladhar range are connected by excellent motorable roads.

The Garhwal Kumaon Himalayas
This region is the heart and soul of the Himalayas. The sources of Ganga and Jamuna are located here. Since the area is the focus of our interest, a separate chapter is devoted to it. However, for the sake of continuity refer Map 5 which gives the approximate alignments of various ranges. Figure 6 gives the details.

![Map of Garhwal Kumaon Himalayas and the Surrounding](image)

**FIG. 6.** THE GARHWAL KUMAON HIMALAYAS AND THE SURROUNDING

**The Nepal Himalayas**

This is the core of the Himalayas. For sheer majesty of its mountains, there is nothing comparable. It reminds us of Gautama the Buddha, the highest peak of humanity as much as of Mount Everest, the loftiest peak of our tiny globe. His compassionate life and the grandeur of these mountains inspired an English poet Edwin Arnold to write the following lines in his *Light of Asia*:

```
. . . . . . . . . . . Northwards soared
The stainless ramp of huge Himala's wall
Ranged in white ranks against the blue — untrod
Infinite, wonderful — whose uplands vast,
And lifted universe of crest and crag,
Shoulder and shelf, green slope and icy horn,
Riven ravine, and splintered precipice
Led climbing thought higher and higher, until
It seemed to stand in heaven and speak with Gods

* * *

Beneath the snows dark forests spread, sharp-laced
With leaping cataracts and veiled with clouds:
Lower grew rose-oaks, and the great fir groves
Where echoed pheasant's call and panther's cry,
Clatter of wild sheep on the stones, and scream
Of circling eagles: — Under these the plain
Gleamed like a praying-carpet at the foot
Of those divinest altars
```
Indians, especially Hindus, visit Nepal for religious festivities and Kathmandu, the State capital, is one of the twelve 'Jyotirlingas' of India which Shaivites consider very holy.

Nepal is a land-locked country which stretches some 800 kilometres (500 miles) from west to east and some 240 kilometres (150 miles) from north to south. It is surrounded on all sides by India except for its northern boundary which is in common with Tibet. Such a vast stretch of land has to be divided into sections to treat it adequately. These divisions are naturally provided by the tributaries of Ganga, namely, Kali, Gogra (Karnali), Gandaki and Kosi—all well-known rivers in India. The western boundary of Nepal is decided by one of the tributaries of Kali and the eastern boundary is marked by Arun, one of the tributaries of Kosi. The natural divisions are now, Karnali, Gandaki and Kosi. The first, Karnali section, stretches from the rivulet Kali to the Kali-Gandaki gorge; the second, Gandaki section, from this gorge to the Trisuli-Gandaki gorge; and the third, Kosi section, from this latter gorge to Arun.

According to Mason, "[the Great Himalaya] enters Nepal on the north-west immediately south of Garbyang on the Kali and rises at once to the Byas Rikhi Himal, which holds the two high peaks of Api and Nampa ... North of it is a second crest-zone of high summits, here identifiable with Zaskar range, which in places seems to come into contact or merge with the main crest, and elsewhere to remain distinct. Generally the Great Himalayan crest-zone is higher; occasionally the northern carries higher summits than the southern. Many of the great rivers cut the southern crest; some cut through it ... In the two crest-zones there are three known summits over 27,000 feet [8,229 metres], Mount Everest, Lhotse, and Makalu, six others above 26,000 feet [7,924 metres] — Dhaulagiri, Cho Oyu, Manaslu, Annapurna I, Gosainthang (or Shisha Pangma), and Annapurna II — and fourteen more over 25,000 feet [7,620 metres]."

Now we will treat each section separately.

The Karnali Section

![Map of the Karnali Section, Nepal Himalayas](image-url)
This section is made up of two ranges, the Zaskar and the Great Himalayas, which have now come so close and yet maintain their separate identity except at Dhaulagiri where they meet. Here the two ranges are known by different names. In the north-west, the northern one is called Kubi Kangri and the southern one Byas Rikhi Himal. In the east, the northern one is called Mukut Himal and the southern one Dhaulagiri Himal. Between these, a little south, is the Mahabharat range of the Lesser Himalayas. Among these 'Himalas', there are so many feeders and their paths so vagrant that it is impossible to describe the courses of rivers without a good map. What we discern are the three important rivers, Seti, Karnali and Bheri, chalk out their vagrant but independent courses through the Lesser Himalayas. Of course, the longer river Karnali alone, like Sutlej of Himachal Pradesh, rises in some place near Mansarover in Tibet. It cuts through the Zaskar range and flows down as 'Humla Karnali' between this range and the Great Himalayas. Later it forces a tortuous passage through the Mahabharat range and meets Seti. The combined waters of these two rivers cut channels through a 'Dun' where Bheri meets them. Now come the Siwalik hills and Terai forests which are common to Nepal and Uttar Pradesh (India). The joint torrent of these three rivers pierces the low lying hills and emerges as the river Gogra of the Indian plains. We list below the names of some important summits in this section.

<table>
<thead>
<tr>
<th>Peak</th>
<th>Height Metres</th>
<th>Height Feet</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Byas Rikhi Himal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gurla Mandhata</td>
<td>7728</td>
<td>25,355</td>
<td>In the Zaskar range called Kubi Kangri</td>
</tr>
<tr>
<td>Api</td>
<td>7132</td>
<td>23,999</td>
<td>In the Great Himalayas called Byas Rikhi Himal</td>
</tr>
<tr>
<td>Nampa</td>
<td>6755</td>
<td>22,162</td>
<td></td>
</tr>
<tr>
<td>Saipal</td>
<td>7034</td>
<td>23,079</td>
<td></td>
</tr>
<tr>
<td><strong>Dhaulagiri Himal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dhaulagiri I</td>
<td>8167</td>
<td>26,795</td>
<td></td>
</tr>
<tr>
<td>Dhaulagiri II</td>
<td>7750</td>
<td>25,429</td>
<td></td>
</tr>
<tr>
<td>Dhaulagiri III</td>
<td>7702</td>
<td>25,271</td>
<td></td>
</tr>
<tr>
<td>Dhaulagiri IV</td>
<td>7639</td>
<td>25,064</td>
<td></td>
</tr>
<tr>
<td>Dhaulagiri V</td>
<td>7585</td>
<td>24,885</td>
<td></td>
</tr>
<tr>
<td>Churen Himal</td>
<td>7363</td>
<td>24,158</td>
<td></td>
</tr>
<tr>
<td>Putha Hiunchuli</td>
<td>7239</td>
<td>23,750</td>
<td></td>
</tr>
<tr>
<td>Sauwala</td>
<td>7174</td>
<td>23,539</td>
<td></td>
</tr>
<tr>
<td>Tukucha</td>
<td>6915</td>
<td>22,688</td>
<td></td>
</tr>
</tbody>
</table>

There are at least three peaks in the Zaskar range (Mukut Himal) which rise above 6,705 metres or 22,000 feet. Thereafter it merges with the Great Himalayas at Dhaulagiri.
The Gandaki Section

![Map of Gandaki Section, Nepal Himalayas](image)

**FIG. 8. GANDAKI SECTION, NEPAL HIMALAYAS**

From the Dhaulagiri mountains, the combined Zaskar-Great Himalayan range enters this section. Thus, we do not have two distinct ranges but two "crest-zones which are almost in contact with each other." There are three groups of mountains in this region separated by deep trenches made by the four main feeders of the Indian river Gandaki, namely, Seti Gandaki, Marsyandi, Buri Gandaki (Buriganga) and Trisuli Gandaki. Of these four, except Seti, all others cut through the combined crest-zones. The names of these groups and the summits are as follows:

<table>
<thead>
<tr>
<th>Peak</th>
<th>Height</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metres</td>
<td>Feet</td>
</tr>
<tr>
<td><strong>Annapurna-Peri-Larkya</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Himal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annapurna I</td>
<td>8074</td>
<td>26,492</td>
</tr>
<tr>
<td>Annapurna III</td>
<td>7576</td>
<td>24,858</td>
</tr>
<tr>
<td>Annapurna IV</td>
<td>7525</td>
<td>24,688</td>
</tr>
<tr>
<td>Annapurna II</td>
<td>7937</td>
<td>26,041</td>
</tr>
<tr>
<td>Manaslu I</td>
<td>8125</td>
<td>26,658</td>
</tr>
<tr>
<td>Manaslu II</td>
<td>7835</td>
<td>25,705</td>
</tr>
<tr>
<td>Himan Chuli</td>
<td>7864</td>
<td>25,801</td>
</tr>
</tbody>
</table>

In Annapurna

In Larkya
The pride of this section is Mount Everest. The two crest-zones, Zaskar and the Great Himalayas, which are together in the previous section now separate out a little and become more distinct. The Indian river Kosi has its sources here. The names of its five feeders are: (1) Bhoté Kosi, (2) Tamba Kosi, (3) Dugh Kosi, (4) Arun and (5) Tamur Kosi. Of these, only two, Bhoté Kosi and Arun pierce through the Great Himalayan range and divide it into three segments — the one between Bhoté and Arun is the Mahalungur Himal range which is of main interest to us. Beyond
Arun is the border of Sikkim which we will study later. The names of some mountains in the Mahalungur Himal range are:

<table>
<thead>
<tr>
<th>Peak</th>
<th>Height</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauri Shankar</td>
<td>7144</td>
<td>23,440</td>
</tr>
<tr>
<td><strong>Mahalungur Himal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cho Oyu</td>
<td>8153</td>
<td>26,750</td>
</tr>
<tr>
<td>Ngojumba Kang</td>
<td>7842</td>
<td>25,730</td>
</tr>
<tr>
<td>Gyachung Kang</td>
<td>7921</td>
<td>25,990</td>
</tr>
<tr>
<td>Pumori</td>
<td>7068</td>
<td>23,190</td>
</tr>
<tr>
<td>Lingtren</td>
<td>6623</td>
<td>21,730</td>
</tr>
<tr>
<td>Everest</td>
<td>8839</td>
<td>29,002</td>
</tr>
<tr>
<td></td>
<td>8847</td>
<td>29,028</td>
</tr>
<tr>
<td>Nuptse</td>
<td>7833</td>
<td>25,700</td>
</tr>
<tr>
<td>Lhotse</td>
<td>8500</td>
<td>27,890</td>
</tr>
<tr>
<td>Pethangtse</td>
<td>6724</td>
<td>22,060</td>
</tr>
<tr>
<td>Makalu I</td>
<td>8470</td>
<td>27,790</td>
</tr>
<tr>
<td>Makalu II</td>
<td>7656</td>
<td>25,120</td>
</tr>
<tr>
<td>Choma Lonza</td>
<td>7815</td>
<td>25,640</td>
</tr>
</tbody>
</table>
There are a number of peaks above 6,705 metres (22,000 feet) but these are too many to be listed. Also, we have said nothing about the Zaskar range because it is overshadowed by the Great Himalayas. However, we must not fail to note the Lapcha Kang range which rises above 7,010 metres (23,000 feet) at some places. Then, there are glaciers which are fed by the snows of these mighty mountains. The names of some are: Rongbuk (with its east and west branches), West Cwm, Khumbu, Nuptse, Lhotse (with its east and west branches), Baru, Kangshung and Khartu.

Under the Nepal Himalayas we have listed in three sections 8 peaks which rise above 8,000 metres (26,248 feet) and 16 peaks which are above 7,500 metres (24,608 feet). Naturally, we are inquisitive about the places from where the best view of these mountains can be obtained. Also, we would like to know whether these places are easily accessible.

Raxaul is a border town in India. From there a road enters Nepal via the Nepalese border town of Birganj. This Birganj-Kathmandu road is the Indian-built mountain highway and is called Tribhuvan Rajpath. On this highway, some 96 kilometres (60 miles) from Kathmandu is a mountain pass of Simbanjyang in the Lesser Himalayas which is 2,438 metres (8,000 feet) high. In the opinion of many, a view of the Himalayas from this pass is the best. On a clear day, the view includes Dhaulagiri, Annapurna and Everest—a grand panorama of all the three sections.

From Kathmandu, there runs a Nepal-Tibet road built by the Chinese. On this road, some 32 kilometres (20 miles) east of Kathmandu is Dhulikhel (1,829 metres/6,000 feet). From here, the view ranges from Himalchuli in the west to Cho Oyo in the east.

Nagarkot (2,286 metres/7,500 feet) is a popular tourist centre some 35 kilometres (22 miles) from Kathmandu (1,372 metres/4,500 feet). It offers a grand panoramic view right from Dhaulagiri in the west to Kangchendzonga in the east. The tip of Everest is also seen, if the visibility is excellent.

Another bus route which takes us from India into Nepal begins from a place called Sunauli. It is on the Indian border near Gorakhpur. The bus goes to Pokhara in western Nepal. It is a lovely spot of serene beauty and is famous for its lake Phewa. Pokhara is not high — it is just 1914 metres (3,000 feet) — but commands an excellent view of Dhaulagiri, Annapurna and Machapuchhare (7,010 metres/23,000 feet). Of course, the best time to view these mountains is October-November, that is after the rains.

A visit to Pokhara allows us to take a side trip to Lumbini, the birthplace of Buddha. It falls on this route and many pilgrims go there.

Nepal Terai, a region close to the Nepal Siwaliks, is not less famous than its high mountains. In the lowlands is the semi-tropical valley of Rapti which houses the Chitwan National Park of Nepal. It is south-west of Kathmandu and is close to the Indian border. Its dense forests and rivers are the natural habitat for wild elephants, tigers and leopards, deers, boars, crocodiles and last but not the least the rare one-horned rhino. It has a hotel called Tiger Tops, which has a cabin in a tree, from where visitors watch these animals.

Nepal is a land of varied contrasts of lowlands and highlands. World Atlas of Mountaineering has a chapter each on the Greater Himalayas and the Nepal Himalayas. Maps, photos and text would help.
The Sikkim Himalayas

This region is really a garden of the Himalayas. Since West Bengal and Sikkim are part of India we include Darjeeling, Kalimpong, Kurseong and the adjoining areas under the Sikkim Himalayas even though these are in West Bengal. The Himalayas make here a unique formation and we leave it to experts to describe it:

"The Great Himalaya in Sikkim is ... directly facing the plains, because of the absence of the Siwaliks. The axis of the Great Himalaya west and east of Kangchenjunga is not easy to follow; on the west it has been broken up by the Arun and by the Tamur Kosi; on the east by the Tista tributaries—Talung, Zemu, Lachen, and Lachung. Though Kangchenjunga is the highest mountain on this short section of the Himalaya running from west to east, it is buttressed north and south by long ridges which have mountains almost as high. Kangchenjunga is in fact unique, as pointed out by Frank Smythe, in that it is a mountain buttressed north, south, east and west so that there are four quadrants of approach; any one of the four faces and four ridges can be chosen for assault."²⁸

FIG. 11. KANGCHENJUNGA AND THE SIKKIM HIMALAYAS²⁹
We give below the distribution of mountains in the ridges:

<table>
<thead>
<tr>
<th>Peak</th>
<th>Height</th>
<th>Metres</th>
<th>Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>West-East Section</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Janu (Nepal)</td>
<td>7709</td>
<td>25,294</td>
<td></td>
</tr>
<tr>
<td>Kangbachen (Nepal)</td>
<td>7858</td>
<td>25,782</td>
<td></td>
</tr>
<tr>
<td>Kangchendzonga I</td>
<td>8578</td>
<td>28,146</td>
<td></td>
</tr>
<tr>
<td>Kangchendzonga II</td>
<td>8474</td>
<td>27,803</td>
<td></td>
</tr>
<tr>
<td>Zemu gap</td>
<td>5875</td>
<td>19,275</td>
<td></td>
</tr>
<tr>
<td>Simvu massif; highest point of which is</td>
<td>6815</td>
<td>22,360</td>
<td></td>
</tr>
<tr>
<td>Siniolchu</td>
<td>6888</td>
<td>22,600</td>
<td></td>
</tr>
<tr>
<td><strong>North-South Section</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lhonak Peak</td>
<td>6480</td>
<td>21,260</td>
<td></td>
</tr>
<tr>
<td>Jongsong Peak</td>
<td>7420</td>
<td>24,344</td>
<td></td>
</tr>
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<td>Tent Peak</td>
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<td>The Twins</td>
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<td>Talung Peak</td>
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<td>Forked Peak</td>
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In these, if the mighty Kangchendzonga massif has the highest peak—3rd in the world—the peerless Siniolchu is the most beautiful mountain on this planet. Those, who have seen it, are in raptures and praise it without any reservation. Karl Wien, perhaps foremost of its admirers, wrote: "Its ridges are as sharp as a knife-edge, its flanks, though incredibly steep, are mostly covered with ice and snow, furrowed with the ice-flutings so typical of the Himalaya. The crest of the cornice-crowned summit stands up like a thorn." Mentioned as second to Siniolchu is Nilkanta in the Badrinath region of the holy Garhwal Himalayas.

The mountainous Sikkim is also a land of glaciers. Starting from the Jongsong glacier, and going counter-clockwise in the four quadrants, we have glaciers Kangchendzonga, Janu, Yalung, Talung and Zemu. Of these, the last one is the most famous. A popular trek runs from Gangtok to Zemu glacier via Chumthang and Lachen. Siniolchu is on Zemu and those who can brave the hazards of this trek can have the privilege to view it.
The Great Himalayas leave Sikkim where the peak of Pauhunri (7,065 metres/23,180 feet) stands like an impregnable fortress overlooking the Chumbi valley. To its north-west is Kangchenjau (6,919 metres/22,700 feet).

Sikkim, like Himachal Pradesh, has motorable roads and Gangtok, the capital, is just 100 kilometres (63 miles) from Darjeeling in West Bengal. From Gangtok a motor road also takes us to the Nathu La and Jelep La passes which lead into the forbidden Chumbi valley of Tibet. Singhik is one of the northernmost towns of Sikkim and can be reached by a car from the state capital. A splendid view of Kangchendzonga can be had at sunrise.

Siliguri (West Bengal) is the railhead for Sikkim. There a highway goes to Gangtok via Kalimpong. Another motorable road runs along the Siliguri-Darjeeling toy-train's railway track. This road leaves the railway lines near Darjeeling and heads north-east to Kalimpong and joins the Siliguri-Gangtok highway.

The region between Siliguri and Kalimpong comes under Sikkim's Lesser Himalayas and was once luxuriantly forested. The joy-ride in the toy-train between Siliguri and Darjeeling was a fascinating experience. At times, wild elephants held up the railway traffic.

On the Siliguri-Darjeeling road, 33 kilometres (21 miles) before the terminus, is Kurseong — a small and quiet hill station which is lower than Darjeeling. The evergreen tea-gardens provide the pleasing surroundings.

Darjeeling is the pride of West Bengal. Over a century, at dawn, millions have watched the sunrise above Kangchendzonga and Everest from the famous Tiger Hill which is just 10 kilometres (6 miles) away from the central township. The Himalayan Mountaineering Institute, which is located near Birch Hill Park, was the first of its kind in India and has become the centre of attraction for world's mountaineers. Tenzing Norgay and his nephew Nawang Gombu live in the campus.

Treks from Darjeeling are many — the one to Phalut via Sandakphu is famous. Kalimpong is about 50 kilometres (31 miles) away from Darjeeling and is right on the roadway.

The Bhutan Himalayas

Between Sikkim and Bhutan is the Chumbi valley of Tibet. The Great Himalayas pass through it. Chomo-Lhari (7,314 metres/23,997 feet) with its satellites rises immediately on the border as the Great Himalayas enter Bhutan. There it stands like a supreme sentinel guarding the state's boundary. Thereafter follow three unnamed peaks: (7,534 metres/24,720 feet; 7,516 metres/24,660 feet; and 7,239 metres/23,750 feet). Then comes the highest peak of the Bhutan Himalayas — Kula-Kangri (7,554 metres/24,784 feet). Further, the Great Himalayas continue without any well-known peak and enter the Indian territory of Arunachal Pradesh.

Bhutan is a small kingdom ruled by a monarch. Paro was its former summer capital and the winter one was Punakha. Today, midway between Paro and Punakha is the new capital Thimphu. The King's palace and the secretariat of the Bhutan government are located here.

Phuntsholing is the border town on the banks of the little known river Torsa. This is the gateway to the remote kingdom of Bhutan. A motor road goes from here to Thimphu. The road was built by the Government of India to link Bhutan with the outside world.
Bhutan is a very sparsely populated country. Most of its land is not habitable. Population is confined to a few pleasant valleys through which flows its largest river Sankosh. Manas is another significant river. Northern Bhutan is bleak and barren and southern is densely forested and is along the Indian borders of West Bengal and Assam. The common boundary is close to ‘Duars’—a term akin to ‘Terai’ of Uttar Pradesh. It means more or less marshy flat plateau. These ‘Duars’ form extensive sanctuaries in both the countries. The magnificent forests of sparsely populated Bhutan draw the attention of every visitor. Highlands and temperate valleys have birch, rhododendron, poplar, pine, cedar, spruce, willow and oaks. The southern region has sal, semal, sissoo and khair. On the Indian side of the common boundary are two famous sanctuaries: Jaldapara in West Bengal and Manas in Assam.

Jaldapara

"Jaldapara sanctuary, in north Bengal, is on the banks of the broad-bedded Torsa river just below the kingdom of Bhutan: 100 sq km of great tree forests and belts of tall grass, with the bed of the river dry but for a few small streams, or overflowing, as the inflows of water from the hills decide.

"Rhesus, tiger, leopard, elephant, the Great Indian Rhinoceros, pig and hog deer are the main mammals. Its rich bird life includes the Lesser Florican, the Great Stone Plover, the Lesser Adjutant and the Blacknecked Stork. Red junglefowl are common in the forest clearings. Fine riding elephants are available."

Manas

"The river Manas, and the associated rivers Beki and Hakua, separate India from the kingdom of Bhutan. The sanctuary is on the southern side of the river. The reverain forests are rich in birds and hold capped langur, elephant, wild buffalo, rhinoceros, swamp deer, sambar, hog deer, pig and an occasional tiger. The sanctuary is about 270 sq km in extent and noted for its scenic beauty.

"In the morning, flights of Great Pied Hornbills cross from the forests of the sanctuary and fly across the river to Bhutan to feed, returning late in the afternoon. On the shores of the Manas, covered with rounded, multicoloured pebbles, one sees waterside birds, not usually seen in other parts of India, such as the white capped red-start, and, on the river, mergansers, ruddy shelduck, large cormorants, egrets and other water birds."

The Arunachal Himalayas

This is the least-known region of the Himalayas. Since it comes under a sensitive border area, Survey of India maps are not available to public; hence information could not be compiled. Also, very little has been written about the former NEFA (North-East Frontier Agency).

Itanagar is the new capital of Arunachal Pradesh. The centrally administered state consists of five divisions: Kameng, Lohit, Siang, Subansiri and Tirap. Bomdila is one town of which Indians might have heard during the Sino-Indian war. It is reached from Tezpur in Assam. Tawang is the last post right on the Indo-Tibetan border. The Himalayan Journal contains some information on the Subansiri division. Similar scattered information may be available elsewhere, but it is yet to be put together.

The Great Himalayas end at Gyalpo Peri (7,150 metres/23,460 feet) and Namcha Barwa (7,755 metres/25,446 feet).
REFERENCES

6. ibid., p. 134
7. ibid., p. 346
10. ibid., p. 5
11. O. H. V. Spate, op cit, p. 16
14. ibid., p. 110. For text see pp. 109-113
15. ibid., p. 11
16. ibid., p. 12
17. ibid., p. 75. "The world's altitude record, so far as we know, was held for about twenty years by one such 'khalasi', engaged by the Survey of India on a salary of six rupees a month (about twelve shillings), who carried a signal pole in 1860 to the top of Shilla in the Zaskar range east of Spiti, 23,050 feet above the sea. He did not know its height; and we do not know his name! [Dr. Longstaff in 1908 first called attention to this interesting record. The height has recently been disputed (*The Mountain World*, 1954, p. 221).]"
18. Wilfred Noyce and Ian McMorris, *World's Atlas of Mountaineering*, Thomas Nelson & Sons Limited, London, 1969, p. 98. "In the Zaskar Range, east of Spiti, stands Shilla, climbed according to tradition in 1860 by a solitary 'khalasi' in the service of the Survey of India, and boasting a height of over 23,000 feet. Recent investigations have shrunken the giant, observations taken by Graaff's party from Mani Kang (21,630 feet) on the Bashahr frontier have reduced the height to 21,325 feet at most. The highest peak of this part of the Zaskar Range, the great round-headed Leo Pargiai (22,280 feet), stands near the junction of the Spiti and Sutlej Rivers and overlooks Spiti, Tibet, and Garhwal. The Gerard brothers climbed to over 19,000 feet early in the nineteenth century, and the summit was reached in 1933 by M. Pauli's party. Seven miles to the north stands Shipki (21,680 feet), still unclimbed and like Leo Pargiai, now out of bounds."
20. ibid., p. 1
21. ibid., p. 29
22. ibid., p. 30. For text see pp. 28-32
23. ibid., p. 32. For text see pp. 32-33
24. ibid., p. 32

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25. ibid., p. 34. For text see pp. 33-36
26. ibid., p. 158. For text see pp. 154-163
27. Wilfred Noyce and Ian McMorrin, op cit, pp. 80-118.
29. ibid., p. 38
30. ibid., p. 37
31. M. Krishnan, India — Wildlife, The Department of Tourism, Government of India, New Delhi, 1977. (The booklet is not paged and is not for sale.) See under Jaldapara.
32. ibid., See under Manas.
2. THE GARHwal KUMaON HIMALAYAS

In the vast stretch of the Great Himalayas the holy Garhwal Kumaon Himalayas lie between the rivers Tamsa (or Tons) in the west and Kali in the east (See Fig. 6). From time immemorial the people of India have designated this region as 'Uttarakhand' and venerated it as something special and sublime — a phenomenon unique in the history of the world. Their heartfelt veneration has found expression in one of their scriptures:

"He who thinks of Himachal, though he should not behold him, is greater than he who performs all worship in Kashi. And he who thinks of Himachal shall have pardon for all sins, and all things that die on Himachal and all things that in dying think of his snows are freed from sin. In a hundred ages of the gods I could not tell thee of the glories of Himachal where Siva lived and where the Ganges falls, from the foot of Vishnu like the slender thread of the lotus flower."

The Himalayas are holy, but this particular Garhwal Kumaon region along with Mount Kailas and Mansarovar, for which this Uttarakhand is a gateway, is the holiest of the holy. Of all Himalayas why did Uttarakhand come to be regarded as holy? Or, what made it holy? These questions have no simple answers. Many think that this region is the source of waters of Ganga, and hence, it is holy. But, this is true only partially. The whole stretch of Himalayas, right from the rivers Tons to Tista, contributes to the waters of Ganga. Then, what is the answer? A more likely answer might reside in the uniqueness of this mountain range itself. In the first place, the range starting from Swargarohini to Nilkanta is prominently seen from the western extremity. (See jacket: Spread 2 by Gansser.) In the same way, the range from Kedarnath to Api is as well seen from the eastern extremity. (See jacket: Spread 1 by Gansser.) In between these two ends, there are many places from where magnificent vast views of these mountains are obtained. Perhaps then, the answer lies in the facile visibility of the Great Himalayas in the region and their impact on the beholders.

Can we know how the ancients reacted to these marvellous views of the Himalayas? Poems in the scriptures do not tell us much. What, then, could be our source of information? Well, humans are human. We do know the reactions of Europeans when they met these mountains for the first time. Their records would enlighten us, and hence, I quote from them at length:

"... I have seen much of European mountains, but in stupendous sublimity, combined with a magnificent and luxuriant beauty, I have seen nothing that can be compared with Himalaya.

"Although none of the Kumaon summits reach an elevation equal to that attained by a few of the peaks in other parts of the chain, for only two of them exceed 25,000 feet, it is probable that the average elevation of the snowy range of Kumaon is nowhere surpassed. For a continuous distance of some 200 miles the peaks constantly reach a height of from 22,000 to more than 25,000 feet."²

"If I wished to give to anyone some notion of the scenery of the Kumaon Himalaya, at elevations of about 6,000 to 10,000 feet, I should advise him to travel in the Italian valleys of the Alps, to which, on a far greater scale, the gorges of the Himalaya have often a strong resemblance. The Val Anzasca,
as you go up towards Macugnaga through the chestnut woods, with Monte Rosa always before you, is not unlike in miniature a valley in the Himalaya, and I hardly like to say that it is less beautiful. But the Indian mountains are grander, their forests are nobler, their whole vegetation is more rich and varied, and nowhere in Europe will you find the splendour of the atmospheric effects and colouring of the Himalaya.

"Still less is comparison possible in the higher regions of the mountains. To the traveller who remembers the wild magnificence of the peaks and glaciers of the Himalaya, and the general sublimity of its aspect, Zermatt and Chamouny seem insignificant. The mere fact that the ranges of the Himalaya are often twice as high as those of the Alps gives no idea of their relative magnitude. The whole of the Bernese Alps might, it has been said, be cast into a single Himalayan valley. You might almost as reasonably, when the Scotch or Welsh hills are white with snow, compare them with Mount Blanc and Monte Rosa, as compare anything in the Alps with Nanda Devi and Trisul. If, preserving the form of its great obelisk, you could pile the Matterhorn on the Jungfrau, you would not reach the highest summits of the Himalaya, and would have a mountain less wonderful than the astonishing peak of Dunagiri.

"Among earthly spectacles, I cannot conceive it possible that any can surpass the Himalaya, as I have often seen it at sunset on an evening in October from the ranges thirty or forty miles from the great peaks. One such view in particular, that from Binsar in Kumaon, stands out vividly in my remembrance. This mountain is 8,000 feet high, covered with oak and rhododendron. Towards the north you look down over pineclad slopes into a deep valley, where, 6,000 feet below, the Sarju runs through a tropical forest. Beyond the river it seems to the eye as if the peaks of perpetual snow rose straight up and almost close to you into the sky. From the bottom of the valley to the top of Nanda Devi you see at a glance almost 24,000 feet of mountain. The stupendous golden or rose-coloured masses and pinnacles of the snowy range extend before you in unbroken succession for more than 250 miles, filling up a third part of the visible horizon, while on all other sides, as far as the eye can reach, stretch away the red and purple ranges of the lower mountains. 'In a hundred ages of the gods,' writes one of the old Sanskrit poets, 'I could not tell you of the glories of Himachal'."

"... the memory of mossy oaks and rhododendron woods, the sough of the breeze, the verdure of the 'rains', the rich brown and emerald of the mountain-sides in drier seasons, the bright sunshine over all, or the poetry of winter evenings by the glowing oaklog on the open hearth ..." so observed E. Sherman Oakley (1888).

"Let us suppose that we have ascended the first range of hills that rises above the plains, in Kumaon, to the lofty peak of Cheena, which overhangs the lake and station of Naini Tal. From this point, the elevation of which is about 8,700 feet, an observer can obtain an admirable general idea of the structure of this part of the Himalaya. Our horizontal distance from the foot of the hills is only about five miles. We look down over the beautiful wooded mountains of the Gagar range, covered thickly with oak and pine, mingled with the gorgeous rhododendron, to the Bhabar forest, which lies almost at our feet, 7,000 feet below, and beyond to the Terai and the great plain. Turning to the north, we have before us a scene which the painter and the poet can alone describe, but which can never pass from the mind of one who has once beheld it. A chaotic mass of mountains lies before us, wooded hills, and deep
ravines, and dark blue ranges, rising one above another; and behind all, piled up into the sky, the snowy peaks of the giant Himalaya. He who has seen this view, or the still finer ones that are to be obtained from other parts of central Kumaon, may feel quite satisfied that he has seen the most sublime and astonishing of all earthly spectacles."

"Double-crowned Ushba in the central Caucasus is the only mountain which I can compare for beauty with Nanda Devi. But the surroundings of the latter are more beautiful even than in Svanetia ... After six visits to the snows I still believe that Garhwal is the most beautiful country of all High Asia. Neither the primitive immensity of the Karakorum, the aloof domination of Mount Everest, the softer Caucasian beauties of the Hindu Kush, nor any of the many other regions of Himachal can compare with Garhwal. Mountain and valley, forest and alp, birds and animals, butterflies and flowers all combine to make a sum of delight unsurpassed elsewhere ... I have always believed that Nanda Devi reigned over the most supremely beautiful part of all Himalaya ...".

"The grandest and most beautiful part of the whole range is the Central Himalaya. ... In this central section of Kumaon and Garhwal there are more than fifty measured peaks of over 20,000 feet, of which seven exceed 23,000 feet. Obviously, a paradise for the mountaineer. Yet when I first went there [1905] none of the great peaks had been climbed. The culminating point of the group is Nanda Devi (25,660 feet), the Ushba of the Himalaya, double-peaked like its Caucasian compeer, but 10,000 feet higher: the most romantic mountain in the world, surrounded by legend of inaccessibility ... ."

A Japanese too has written on this region. Perhaps, he has not expressed his own opinion, but paraphrased what others said. Anyway, it is worthwhile to copy down his notes so that we have a broad spectrum of views.

"The Garhwal's attraction is not dignity but a charm that permits climbers to work slowly to the top of the ice-covered peaks and then descend into beautiful flower-decked valleys. It is the consensus of climbers that only in the Garhwal Himalayas can one combine the beauty of nature with a rigorous climb up a high mountain. But climbing in the Garhwal is no picnic, with its numerous peaks over 7,000 meters high.

"The highest Garhwal peak is Nanda Devi, 7,817 meters, called the pearl of the Himalayas for its loveliness. The graceful symmetry of its perfect twin peaks thrusting to the sky, the main and the east peaks, is a rare visual treat. T. G. Longstaff, who knows almost everything about these mountains, has praised Nanda Devi, believing no mountain in the world is more beautiful.

"The loveliness of the Garhwal Himalayas is unchallenged by the primitive splendor of the Karakoram, the Caucasian grace of the Hindu Kush, or the icy ruggedness of the Nepal Himalayas. Mountains and valleys, forests and meadows, butterflies and flowers—everything is in harmony, producing a supreme sensual pleasure for the mountaineer."

These are then some of the best responses to the holy Garhwal Himalayas. The opinions gathered here amply justify what the ancients thought of this unique region. The question before us today is: Do people respond to these mountains as did our ancestors, or the early Europeans? In other words, have we preserved the
sanctity of these sacred places? Have we preserved the forests and the wildlife with the attendant holiness? The answers to these questions are regretfully in the negative.

Temples and shrines do not make places holy. It is the sublime atmosphere and the overall impact of the surroundings on our being which make a few regions on this planet sacred. If people of India do not realize this fact in time then the Himalayas will cease to be holy and will become an icy waste like north and south poles. A time has already arrived when every Indian, nay everybody on this earth, has to make up his mind in what condition he wants the Himalayas -- the greatest glory of this planet -- to be. Does he want it to remain pure, untouched by man? If so, what steps does he propose to take and how would he execute them? With these questions unanswered, we go ahead.

The Great Himalayas enter Uttarakhand from the Baspa valley of Himachal Pradesh, where the crest-zone runs along the northern limits of the valley and contains at least two summits which are over 6,400 metres (21,000 feet). As the range cuts the state boundary and continues south-eastwards, it presents no distinguishing feature until it closes the Badrinath knot -- a complex of tangled mountains and glaciers in which are the summits of Chaukhamba and Satopanth and the glaciers of Gangotri and Chaturangi. After the Badri-knot is a vast depression in which flows the river Alaknanda. A little higher in the hills are the pilgrim towns of Pipalkoti and Chamoli. Thereafter the crest-zone lifts up again at Nandakana and forms a still formidable complex of mountains and glaciers which contains the famed Nanda Devi, Trisul and Dunagiri. At Nandakot, it goes down in another depression through which flows the river Goriganga. When it lifts up again, it is Panch Chuli group of mountains. Depression thereafter delimits the Indian boundary, and the river Kali flows there.

North of the Great Himalayan range is the Zaskar range. Here it forms the boundary between India and Tibet. The most conspicuous part of this range lies between the sources of the rivers Saraswati and Dhaul. It contains Kamet, Abi Gamin, Mana and many other well-known peaks and glaciers.

South of the Great Himalayan range is the Dhauladhar range of the Lesser Himalayas. It comes from the Baspa valley of Himachal Pradesh where it runs along its southern limits. As it cuts the state boundary, it lifts up to the Bandarpunch range of mountains. Thereafter it goes down, where the river Bhagirathi cuts it below Suki. But it rises once again abruptly and heads to join the Badri-knot. In it are Srikanta, Gangotri, Jogin, Thalaiyasagar and Kedarnath -- all high mountains.

Further south are the ranges of the Lesser Himalayas and Siwaliks. The region is noted for its dense tropical and coniferous forests. Also, in rains, many times hillsides crumble and disappear or leave behind lakes. The hill stations of Chakrata, Mussoorie, Kausani, Ranikhet, Almora and Nainital are located therein.

The preceding paragraphs give the general topography of the region. We would like to study it in greater depth a little later. For the present I would like to expose my own ignorance of the Himalayas when I visited them.

When I went to Jamnatri, I did not know that I was on the outskirts of the Dhauladhar range and the mountains of the Great Himalayas were far behind this range. Only thing I knew was that the source of Jamuna was not near the temple but some 8 kilometres (5 miles) away near the Bandarpunch range. Likewise, when our road was passing through a narrow passage near Gangnani, I was not aware that
we were going through a gorge made by the river Bhagirathi in the Dhauladhar range. What I could record then was: "From Maneri onwards the Bhagirathi course had few bends. A little ahead of Gangnani we passed through a fairly long gorge. Mountains were high but devoid of much vegetation ..." How wonderful to know the topography now!

Further at Harsil the road had turned to my right and I had made one entry in my diary: "The surroundings around Harsil-Kapang-Lanka were simply beautiful." I did not realize then that I was in a trough between the Great Himalayas and a subsidiary range — Dhauladhar. My entry continued: "Lanka looked splendid ... I saw snow-covered mountains. To my left was one such cluster, to my right another." But I missed the name of the range — Dhauladhar. At Gangotri, I was close to the heart of the Great Himalayas, but then all mountains to me were white and high. At Kedarnath, I was standing on the threshold of our much discussed range Dhauladhar but I could not tell even that.

The road to Badrinath was not exciting except in its last phase. The knowledge of topography could have enlivened it. The Alaknanda gorge was stupendous and the road through it was a marvel of modern engineering feat. Our bus was clearing one incline after another, yet, I was not aware that on the top of these mountains was a broad valley which was situated in a trough between the Zaskar and the Great Himalayan ranges. In fact, the Great Himalayan peaks were behind me. The magnificent look of Nikkanta was blocking the view of Chaukhamba peak from Badrinath. Nikkanta itself was not along the main axis of the Great Himalayas but a little off the mark. Well, can ignorance be a bliss?

Having admitted my own ignorance of the Himalayas I give now a fuller account of it. I divide the Garhwal Kumaon Himalayas into five natural mountain blocks. Two blocks fall in the Garhwal region; the other two in the Kumaon region. (See the maps below.) The one in between these two is not demarcated on the maps.
The Garhwal map shows the Bandarpunch mountain block between the rivers Tamsa (Tons) and Bhagirathi. The Badri-Kedar mountain block is between the latter river and Alaknanda. The third, Kamet block, is between the rivers Saraswati and Dhauliganga and is not shown in the map but can be easily identified from the regional map given earlier (See Fig. 6).

The Kumaon map shows the Nanda Devi mountain block between the rivers Dhauliganga and Goriganga. The Pindar river associated with the famous Pindari glacier is south of the block. Finally, the fifth mountain block, Panch Chuli, is between the rivers Goriganga and Darmaganga — a tributary of the river Kali or Kaliganga.

Now we take up each block one by one.

**Bandarpunch Mountain Block**

The view of this range is beautifully shown by Gansser. (See Spread 2.) Bandarpunch is splendid. I have seen it from a high point on my way to Barkot. It is also seen from many other places. Among these, Dhanolti and Surkhanda Devi should be taken note of (see the sketch Map 8). The impression of the mountain can be had in the words of a mountaineer J.A.K. Martyn: "... the view of Bhandarpunch looked very tempting. Though under 21,000 feet, this mountain, by reason of its isolation between the Bhagirathi and the Jamuna, looks magnificent."

Approaches to the Himalayan mountains are rarely by roads. Today a few motorable roads take travellers close to these ranges. A schematic map not to the scale is given below which shows these roads. It is supplied by the Tourist Office of the Government of Uttar Pradesh, Lucknow. It shows the region south of the
Bandarpunch range. I have inserted an inset. It helps to identify mountain ranges within an area demarcated by the points Sayana Chatti, Uttarkashi, Harsil and Yamunotri on the sketch map.

**SKETCH MAP**

Not to scale

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**MAP 8. ROADS TO YAMUNOTRI AND GANGOTRI**

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The bridle-path starting from Hanuman Chatti to Dodi Tal and on to Uttarkashi, as shown in the sketch map, can now be traced through the maze of mountain ranges on the inset map. First the path is along Hanumanganga. Then, one crosses over a high pass which is simply shown as a gap in the mountain chain. Later, one follows a trek along a stream which goes by the lake Dodi Tal on to Bhagirathi where the main motorable road takes over. Further, if one studies the inset map carefully, one can find his way from Hanuman Chatti to Jhala via the well-known Bunsor pass. This latter trek should give an excellent view of Bandarpunch and its ranges.

This is the place where we introduce the high peaks of the Bandarpunch mountain block. For this, we give below a sketch map which shows the main ridges and glaciers.

MAP 9. SKETCH-MAP OF THE UPPER TONS BASIN

In the map, from north to south, we see three parallel ridges which in the east are connected by two successive vertical ridges. In the west an open ridge allows the enclosed glaciers to drain out through the associated streams. Of the three parallel ridges, we can name only two — the one containing the mountain Swargarohini, the Swargarohini range and the other containing the massif of Bandarpunch, the Bandarpunch range. Taking the open ridge as (1) and going round in the clockwise direction, we number the topmost ridge as (2), the vertical ridge as (3), the parallel Swargarohini range as (4), the next vertical ridge as (5) and the final Bandarpunch range as (6). On the western slopes of the third ridge is the glacier Jamdar Bamak. The word 'Jamdar' is the corrupt form of 'Yam Dwar' which means 'Death-God's Door'. In this context the mountain Swargarohini (Ascent to Heaven) has the contiguous meaning. It rises south of Jamdar Bamak. The Bandarpunch glacier is on the western side of the fifth ridge and to its south is the famous Bandarpunch range.
On the eastern side of the third ridge, from top to its end are three glaciers: Lamkhaga Bamak, Ratlya Bamak and Siyan Bamak. Also, at the junction of the fifth ridge and the Bandarpunch range is Bartiyakhunt Bamak. These glaciers are not shown in the map because the associated rivers belong to the Bhagirathi basin and not to the Tons basin. Two small glaciers Jakhai Bamak and Chhaian Bamak, a little south-west of the Bandarpunch range do contribute waters to the Tons basin but could not be accommodated in the rough sketch map. In this connection, it should always be borne in mind that the Survey of India maps are the best guides in the matter.

We now list the outstanding peaks in these ridges:

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<th>Height</th>
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<tr>
<td>to west)</td>
<td>Bandarpunch</td>
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<td>6102</td>
<td>20,021 (78^\circ, 33', 17'')</td>
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Heights in metres are from the Survey of India maps.

In the above list only two peaks have names — Swargarohini and Bandarpunch. Readers who might want to see the photographs of these mountains are advised to consult the bibliography at the end.

We have already given the locations of glaciers within and without the ridges. We list them now at the cost of being repetitive.

Glaciers

**Tons basin**

(1) Jamdar Bamak  
(2) Bandarpunch  
(3) Jakhai Bamak  
(4) Chhaian Bamak

**Bhagirathi basin**

(1) Lamkhaga Bamak  
(2) Ratiya Bamak  
(3) Siyan Bamak  
(4) Bartiyakhunt Bamak

Jamuna is the major river between the peripheral rivers Tons, and Bhagirathi. Tons demarks the boundary between the states of Himachal Pradesh and Uttar Pradesh and in this sense belongs to both the states. Also, some of the sources of the river are entirely in Himachal Pradesh. Bhagirathi rises in the Badri-Kedar mountain block and its rightful place is there. Thus, we are left with only one significant river in this region and it is Jamuna.

Jamuna, as we have noted earlier, has its origin a few miles away from the pilgrim centre of Jamnotri \((31^\circ \, 0' \, N, 78^\circ \, 33' \, E, \, B Burrard)\). It arises on the south-western slopes of the Bandarpunch range and its location is given by the Encyclopaedia Brittanica as \(31^\circ, 3' \, N\) and \(78^\circ, 30' \, E\). At its origin the elevation is 3,307 metres \((10,849 \, \text{feet})\) and in the next 16 miles it falls at the rate of 314 feet in a mile. During this fall, it collects waters from several small feeders. Hanumanganga is one among them and meets it at Hanuman Chatti. Further downstream it is joined by Tons at Kalsi. The latter brings nearly double the volume of water of the renowned stream called Jamuna. The question arises: Should the stream Jamuna be taken as the origin of the river Jamuna or the mighty stream Tons which comes from the Bandarpunch glacier? This question cannot be settled by us. It has to be answered by the geographers and geo-scientists because they have some criteria for fixing the origins of rivers. We simply note: How unfortunate it is that in the 20th century such questions are not settled in India! Why does the tradition come in the way? We do not deny any pilgrim’s right to worship any stream he likes. Be that as it may, the combined waters of these streams make the river Jamuna of the Indian plain. It emerges from the Himalayan ranges and continues south-west into the Dun. At the 95th mile of its course,
it forces its way through the Siwalik range and descends upon the plains of India at Faizabad in Saharanpur district.

Rivers

**Jamuna basin**

1. Jamuna
2. Hanumanganga

**Tons basin**

1. Morinda Gad
2. Mata-ki-Gad
3. Har-ki-Doon
4. Tons
5. Rupin (partly in Himachal Pradesh)
6. Supin

**Badri-Kedar Mountain Block**

This block, although not as complex as the Nanda Devi block, is of sufficient intricacy. It is made of a maze of ridges which presented a puzzle and a challenge to early travellers — so much so that Major Gordon Osmaston, surveyor-in-charge of the Gangotri triangulation observed: "... here in 150 square miles, there was only one doubtful point. This point was the elusive Satopanth peak, 23,240 feet, which has consistently been misidentified by explorers. It lies hidden away behind the ranges on no main watershed, rather like the main peak of Nanda Devi." Satopanth, unlike its famous compeer, is not the highest peak among its surrounding mountains. The main peak of the Chaukhamba massif, Badrinath, is the highest point.

This false identification misnamed the Satopanth glacier and the frozen Satopanth Tal — a mistake that has persisted to this date. The names have stuck and cannot be erased. The intricate arrangement of these mountains too can be understood: Two mighty converging ranges met at the Badri-knot and in gigantic upheaval these entangled ridges were born.

The Badri-Kedar range, in its west-east direction, stretches from Srikanta to Nilkanta and in its north-south direction, it is from Shri Kailas to Kedarnath. The west-east section is seen in Gansser's spread 2 and the north-south region is seen in sketch Maps 10 and 11.

Two sketch maps for the Gangotri glacier are given. This is deliberate. The aim there is to show how early explorers identified the various ridges differently. The two maps differ in minor details only but these are not insignificant — and should not be passed over.
MAP 12. ROADS TO KEDARNATH AND BADRINATH
A part of Tehri-Garhwal is to the west of the Gangotri glacier and is well illustrated by Tyson's map (see below). The road map is on page 66.

![Map of Tehri-Garhwal](image)

MAP 13. PART OF TEHRI-GARHWA

The Badri region is to the east of the Gangotri glacier. The roads to Badrinath and Kedarnath are shown in a schematic sketch map (Map 12), not to the scale, prepared by the Tourist Office of the Government of Uttar Pradesh, Lucknow. This time an inset map is not placed because the Survey of India map for the region is available and is in the jacket at the end of the book.

The ridges in the aforesaid maps are so many and their distribution so irregular that it is difficult to number them in some convenient order. To overcome our predicament we adopt the following scheme: Mountains north of Thelu, Rakivarna and Pilapani Bamak, we lump them in Group I. In Group II are placed those mountains which are between these glaciers and the Chaturangi glacier. Then comes the main axis of the Great Himalayas which we label by the same name. Summits south of the Gangotri glaciers and the Bhaghirathi river are in the Dhauladhar range and are grouped accordingly. The final tabulation is as under.

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<td>20,523</td>
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<tr>
<td>Kirti Stambh</td>
<td>-</td>
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<tr>
<td></td>
<td>6285</td>
<td>20,621</td>
<td></td>
</tr>
<tr>
<td>Bhartekhunata</td>
<td>6578</td>
<td>21,582</td>
<td></td>
</tr>
<tr>
<td>Kedarnath</td>
<td>6940</td>
<td>22,770</td>
<td>(30°, 47', 53&quot;)</td>
</tr>
</tbody>
</table>
|                 | 6830    | 22,409         | 79°, 4', 7""
|                 | 6443    | 21,140         |                |
| Mahalaya Parvat | 5970    | 19,588         |                |
| Sumeru          | 6360    | 20,867         |                |
| Kharchakund     | 6632    | 21,760         | (30°, 46', 46") |
|                 | 5740    | 18,833         | 79°, 7', 47""
| Mandani Parvat  | 6193    | 20,319         |                |
|                 | 6639    | 21,783         |                |

Heights in metres are from the Survey of India maps.

Some of these mountains are of great beauty. But they are in such terrains that one has to become a mountaineer to get even a glimpse of one of them. Trevor Braham, who had camped near the Chaturangi glacier, wrote: "I walked to the head of the Sundar glacier under a fantastic cirque of six peaks, three of them above 22,000 feet." What did he see? He saw an avalanche drop some 5,000 feet right before his eyes. Heim and Gansser have actually photographed one such fall in the Bhogat Kharak glacier. This means that mountains are lovely but far beyond the reach of most men.

Two mountains which are easily approachable and renowned for their beauty are Shivling and Nlankta. The former is at the head of the Gangotri glacier and easily seen from Gaumukh. I have not seen it and I would not attempt to describe it. The latter I have seen from the town of Badrinath in its full glory under a clear moonlit sky. It "rises about five miles west of Badrinath ... Smythe described it as second in beauty only to Sinijolchu." Nlankta, as seen from the town of Badrinath, shows out of its three distinct ridges, namely, south-east, west and north-east, only the first one and a part of the last ridge. "The beautiful white dome ... supported on ice cliffs, is separated from a lower band of black granite rock by an almost vertical 150-foot ice-wall formed by glacial action."
Nilkanta leaves a deep impression on its beholder. The lovely impact it made on me was beyond words. Since then, I have seen quite a few photographs of it and the one I liked most is sketched below. The poem I have appended speaks of my reverence for the entire Himalayas.

FIG. 12. NILKANTA (Sketch by the author)

हिमालय हिमाद्रिराज
गुरुवर गिरिराज
पूर्वांचल प्रकृति
हिमपुष्प सूर्य
नील आकाश
निम्नलिंग प्रात
ज्योतरमण सावितर
ऋतुं रसमी
प्राचीन प्रजा
प्रज्वलित अंजली

King of Snows — Himalaya
Among mountains, you are a revered teacher
Your landscape is flowerless
But your snowscape is flower-white
In azure sky
At pure dawn
The flaming golden sun
With its soft rays
Laden with enlightened wisdom
Ignite a glowing tribute-offering

The Badrinath mountain, which is an alternative name for the Chaukhamba peaks or massif, is not seen from the town of Badrinath itself. Nilkanta and Narayan Parvat block the view. To see it, one has to go all the way to the Mana township along the river Vishnuganga which, in this part of the country, is the alternative
name for the river Alaknanda. A little ahead of it are the Vasudhara falls and the Bhagat Kharak glacier. From the latter place, Heim took an excellent photograph of the whole Badri-range. I have used this photograph to sketch a part of the range which shows Nilkanta, Kunaling and Badrinath. The sketch is given below:

![Sketch of Badrinath group from the northern side of the Bhagat Kharak Glacier](image)

**FIG. 13. BADRINATH GROUP from the northern side of the Bhagat Kharak Glacier**
*(Sketch by the author)*

Mountains which are most conspicuous in the Badri-Kedar region are those of the Dhauladhar range. Places from where each individual peak is seen at its best are as under. At Madhmaheshwar (3,289 metres/10,791 feet), the junction of Dhauladhar with Chaukhamba comes in the full view. Mandani Parvat is visible from the Mandani temple (3,574 metres/11,726 feet). The summit of Kedarnath and its surrounding peaks are right before us at the Kedarnath temple. The name of Kedarnath (3,584 metres/11,759 feet) is always taken along with that of Badrinath (3,095 metres/10,155 feet) and the mountain here is of great sanctity. Triyuginarayan (1,982 metres/6,503 feet) offers a panoramic view of this very range. The peaks of the western part of Dhauladhar are best seen while going from Harsil to Lanka. In short, this is the most accessible range of Uttarakhand.

These sky-scraping pinnacles at their bases have equally large glaciers. The largest is the Gangotri glacier. It is 30 kilometre (18.75 mile) long and 2 kilometre (1.25 mile) wide. It is fed from north by its subsidiary glaciers, Malandi Bamak and Swachhand Bamak and from south by Ghanohim Bamak, Kirti Bamak and Meru Bamak. At Nandanban, it is joined by the Chaturangi glacier which in turn is fed by Kalandani Bamak, Seta Bamak, Suralaya Bamak and Vasuki Bamak. Nandanban and Tapoban are two broad glacial terraces a few miles from Gaumukh. North-east of this glacial confluence are the glaciers of Pilapani Bamak and Nilambar Bamak which fall into Raktvarna Bamak. The last one, towards its end, is joined by Swetvarna Bamak. The names of these glaciers are derived from the colour of the surrounding rocks. They form a close-knit system and are linked in some way to the Chaturangi glacier.

Actually, these ice-streams are sluggish. They hardly appear to move. They are overlain with detritus and seem to float on their moraines, which they are incapable of sweeping away as they did in the early glacial period—the proof of this lies in the beautiful horn shaped peak of Shivling which is formed by excessive frost shattering. Above the medial moraines, at the height of about 200 metres (656 feet) are
the old lateral moraines from which huge boulders and pebbles roll down casually. This is the scene around Tapoban.

Gaumukh (3,892 metres/12,770 feet) is considered the snout of the Gangotri glacier. Traditionally, it is taken as the sacred origin of the river Bhagirathi. A sketch of it, made by the author from Raghubir Singh's photograph is given below:

![GAUMUKH (Sketch by the author)](image)

It shows "a grey blue wall". "The ice-cave through which the water of the Bhagirathi pours out, has been changing positions frequently. Melted water percolates through the crevasses and forms an undercurrent below the glacier, flowing through an ice tunnel. Below the snout, for a few kilometers, there are a series of recessional moraines. Between the Gangotri and Bhujwasa, the last remains of boulder clay stand in the form of pillars topped by huge boulders. They are about 50 meter tall. From the Gaumukh to the Gangotri temple, the valley of the Bhagirathi is wide and U-shaped."²³

Bhagirathi, as it flows from the snout to the Gangotri temple, collects waters from several streams. The rivulets in the region are called 'gad' or 'gadhera'. One such feeder from a northern glacier called Matri Bamak augments the rapid. From south, Bhrigupanth Bamak and Manda Bamak further increase its volume of flow through their respective rivulets. Near Gangotri, the celebrated confluence of Bhagirathi and Kedarganga makes the place sacred. The latter comes from the glacier Kedar Bamak which is north of Thalaiyasagar and has nothing to do with the Kedarnath region, which is far off. Anyway the name has stuck and cannot be done away with.

Gangotri is an eye-catching spot. Once upon a time it must have been a very beautiful place and I have no doubt about it in my mind. Today, the forests have thinned, but these can be easily restored if the resident sadhus have the will. I have captured my vision of it in a sketch. Poem below it is my description of it.
From Gangotri, the Bhagirathi river cascades down in leaps and bounds. At Bhaironghati, it is embraced by an equally tempestuous river Janhavi or Jodhganga whose origins are in the northernmost part of Uttarakhand and in Himachal Pradesh. The latter is out of the ambit of this chapter and we skip the detailed account of glaciers which contribute waters to this sacred river. The noteworthy features of these rivers around here are that they have cut awe-inspiring gorges through tourmaline granites constituting the central axis of the Himalayas. A sketch of the Bhagirathi gorge made from a photograph by the author is given in Fig. 16.
The course of Bhagirathi is longitudinal (westward) right from Gaumukh to Harsil. On its way it is met by small and big streams. The rivulet Rudugaira Gad comes from the glacier Rudugaira Bamak and runs into the south bank of Bhagirathi somewhere between Gangotri and Bhaironghati. Dudu Bamak is one other glacier from which flows Dudu Gad whose confluence with Bhagirathi is at Kapang. From north comes a tributary Jalandari Gad which arises in the glacier of Kalapani Bamak and empties its waters into Bhagirathi at Bagori. Now the river takes a sharp southward turn between Harsil and Suki. Around these towns, streams come from the eastern glaciers of the Bandarpunch mountain block which pour their waters into the rapid. The river closes on to the Dhauladhar range and a torrent of Lod Gad runs down from the glacier Jaonli Bamak and meets it between Suki and Gangnani. Around this latter place the Bhagirathi river cuts its way out through the Dhauladhar range. The glaciers Goni Bamak and Mechha Bamak give rise to their respective rivulets Goni Gad and Bhetiara Gad which form Kuni Gad which in turn falls into Pilang whose confluence with Bhagirathi at Malla is noteworthy. From Malla, the river takes its course south-westward right beyond Uttarkashi, where it bends south-eastward to reach Tehri. This place is celebrated for the confluence of Bhillanganga with Bhagirathi.

South of the Dhauladhar range, between the Jogin group of mountains and the Kedarnath peak, are a group of glaciers — Jogin Bamak, Ratangariyan Bamak, Khatling Bamak, Phating Bamak, Bhartekhunta Bamak, Satling Bamak and Dudhganga Bamak — which are interconnected in some intricate way. The river Bhillanganga comes out from Phating Bamak and Khatling Bamak. From Dudhganga Bamak flows the river Dudhganga.

From Tehri, the Bhagirathi river continues the same south-eastward course until it meets the river Alaknanda at Deoprayag. Here the combined waters become the holy Ganga.
The Alaknanda river rises from the snout where the glaciers Satopanth Bank and Bhagirath Kharak Bank meet. The word 'Bank' in the local language means a glacier. Perhaps, it is a variation of 'Bamak'. Be that as it may, the Satopanth glacier is just opposite to the Gangotri glacier — the Chaukhamba massif is in between them. The glacier here is 11.2 kilometres (7 miles) long and is separated by high mountains from a still longer (19.2 kilometres/12 miles) glacier called the Bhagirath or Bhagat Kharak glacier. These two combine at the head and give birth to the river Vishnuganga — the local name of Alaknanda.

Gansser has sketched both the Bhagat Kharak glacier and its head. These are shown in Fig. 17 & 18. His description of the former is not much different from the one we read for the Gangotri glacier. In fact all the glaciers in the region have more or less the same characteristics. And, from the topographical point of view this is not at all surprising.

![Camp 3 — October 5, 1936 5150 m](image)

**FIG. 17. BHAGAT-KHARAK GLACIER FROM THE EAST**

From the confluence of glaciers, the course of Alaknanda is longitudinally eastward. The Satopanth lake, which is south of the Satopanth glacier near Chaukhamba, is formed by ancient giant glaciers which deposited moraines in such huge quantities that the valleys shrunk by continuous plugging process into a frozen encavation. Today it is a small relic of the past. Alaknanda flows down to the Vasudhara falls, an enchanting place, where the stream takes a small leap. Then to Mana, the stream's course, from the glacial confluence to this township, is not long, but here, it is met by a still longer river Saraswati which arises around the famous Mana pass on Indo-Tibetan border. The river Saraswati cannot be said to belong to the Badri-Kedar region because it is wholly fed by the feeders from the glaciers of the Karmet region — the only exception being the Arwa river which meets it at
Gashtoli and arises in a region delimited by the glacier Mana Bank, the pass Kalandani Khal and the lake Arwa Tal. As such, Alaknanda collects its waters as much from the Kamet and Nanda Devi regions as from the Badri-Kedar region. In this sense, it is a central river of the whole Uttarakhand and its drainage system is so complex that it is not convenient to describe it within the boundaries of one specific region. Fortunately, we have the Survey of India map for this particular area which helps us to follow the course of the river. (See Route Map from Rishikesh to Badrinath-Kedarnath in the jacket.)

FIG. 18 THE HEAD OF BHAGAT KHARAK GLACIER, after A. GANSSER (1939)

"At 12,300 feet we were at the level of the two big glaciers, whose lower ends still almost touched. One of them is the holy Satopanth, flowing for the S. W., whose icy gate is, according to the Hindus, the true source of the Ganges and the other, coming from the west is the Bhagat-Kharak, which is nearly 12 miles long. Almost completely covered with detritus, they are not of an impressive appearance, being sluggish ice-rivers unable to free themselves of the rubble which falls on them. Another peculiarity of these two glaciers is that between their high-gabled lateral moraines and the rocky walls of the gorge are little valleys where pastures flourish around tarns or where tarns have been — this showing that the glacier has had no lateral expansive energy. By the same token, there is no sign of glacial exfoliation on the walls of the valley. One gets the impression that the ice flows in a furrow between moraines, like a sluggish river that builds up its bed higher instead of excavating it."

From Mana, the combined waters take the course of Saraswati which is transverse (southward) and run down as Vishnuganga to the Badrinath temple where they offer homage to the presiding deity. Onwards, the river cuts a stupendous gorge whose description we have already read in the first part of this book. A sketch drawn by Heim which depicts its true magnificence is reproduced in Fig. 19.

At Vishnuprayag, the confluence of the river Vishnuganga with the river Dhauliganga is celebrated. The latter river is not an ordinary one. Its sources are far and wide and belong to diverse regions — the Kamet, the Girthi and the Rishi gorge of Nanda Devi. Henceforth the river is known by only one name, Alaknanda.
Near Joshimath, it flows through a denuded valley whose forests were once the pride of the town and its people. From here, the river's course is south-westward. Before Chamoli, it is joined by the river Birahiganga whose sources are in the mountains west of the Nanda Devi block. After Chamoli, once again the course turns southward and at Nandprayag the confluence of rivers Alaknanda and Nandakini makes the town noteworthy. Nandakini takes its name from the Nandakana mountain. Its sources are located there. From Nandprayag the strike of the river is south-westward until it reaches Karnaprayag. Here, the Pindari river which comes from the famous Pindari glacier runs into the eastern bank of Alaknanda and the confluence is considered as usual sacred. The river takes now a sharp turn eastward and flows to Rudraprayag where it is joined by an equally famous river Mandakini which comes from Kedarnath. This makes the confluence more holy.

![Image: The Gorge of the Alaknanda River](image)

**FIG. 19.** THE GORGE OF THE ALAKNANDA RIVER (Upper Ganges). Above Vishnuprayag (V). View towards N. Kumaon Himalayas; after Heim (1939)

The Mandakini river originates around the frozen lake of Chorabari Tal which along with the nearby Vasuki Tal has the same antecedent as that of the foresaid lake Satopanth Tal. On its way down it gathers waters from several notable rivulets like Songanga, Kaliganga, Mandanganga, and Madhmaheshwarganga. Finally, when it reaches Rudraprayag it is a river in its own right.

At Rudraprayag the Alaknanda river is no mean stream. It is sizable. As it progresses towards Srinagar and Deoprayag, its waters are augmented by the waters of many rivers and it becomes a mightily torrent when it merges into the Bhagirathi river to become the holy Ganga.
The course of Ganga, as it rushes down from Deoprayag to Rishikesh, is quite zigzag. It flows south-west for some distance and then turns north-west and again a little to south-west. The notable feature is that it leaves the Lesser Himalayas at Laxman Zula and enters the wide dun of Rishikesh. It cuts through the Siwalik range at Hardwar and becomes the familiar Ganga of the plains.

This is all about the drainage system of the Badri-Kedar mountain block. For the sake of completeness these glaciers and rivers are grouped now to bring some semblance of order.

### Glaciers

<table>
<thead>
<tr>
<th><strong>The Bhagirathi system</strong></th>
<th>Remark</th>
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<tbody>
<tr>
<td>Gangotri</td>
<td></td>
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<tr>
<td>Malandi Bamak</td>
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<tr>
<td>Swachhand Bamak</td>
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<td>Ghanchhim Bamak</td>
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<td>Kirti Bamak</td>
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<td>Meru Bamak</td>
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<tr>
<td>Chaturangi</td>
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<td>Kalandani Bank</td>
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<td>Seta Bank</td>
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<td>Vasuki Bamak</td>
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<td>Pilapani Bamak</td>
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<td>Swetvarna Bamak</td>
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<tr>
<td>Thelu Bamak</td>
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<tr>
<td>Matri Bamak</td>
<td>North of the Bhagirathi river</td>
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<tr>
<td>Chaudar Bamak</td>
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<tr>
<td>Kalapani Bamak</td>
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<td>(See glaciers of the Bandarpunch range)</td>
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<tr>
<th><strong>The Bhagirathi system</strong></th>
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<tr>
<td>Bhrigupanth Bamak</td>
<td>South of the Bhagirathi river</td>
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<td>Manda Bamak</td>
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<td>Kedar Bamak</td>
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<td>Rudugaira Bamak</td>
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<td>Dudu Bamak</td>
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<td>Jaonli Bamak</td>
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<td>Dokriani Bamak</td>
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<td>Goni Bamak</td>
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<td>Mechha Bamak</td>
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<thead>
<tr>
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<tbody>
<tr>
<td>Jogin Bamak</td>
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<tr>
<td>Ratangariyan Bamak</td>
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<td>Bisali Bamak</td>
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<td>Satling Bamak</td>
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<tr>
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<tbody>
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<td>Mana Bank</td>
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<tr>
<td>Bhagirath Kharak Bank</td>
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<td>Luri Bank</td>
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<td>Satopanth Bank</td>
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<tr>
<td>Puna Bank</td>
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<td>South of Chaukhamba</td>
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### Rivers

#### The Bhagirathi system
- Bhagirathi
- Kedarganga
- Rudugaira Gad
- Jodhganga
- Duduganga
- Sartia Gad
- Khera Gad
- Jalandari Gad
- Kahora Gad
- Tel Gad
- Sian Gad
- Son Gad
- Din Gad
- Pilang Gad
  (several others)
- Bhillangana

#### The Mandakini system
- Mandakini
- Songanga
- KaliGanga
- Madanganga
- Madhmaheshwarganga
- Damarganga
- Pabi

#### The Alaknanda system
- Vishnuganga
- Satpati
- Pabigar
- Supan
- Saraswati
- Arwa
- Alaknanda
- Dhauliganga
- Rudraganga
- Patalganga
- Birahiganga
- Balasuti
- Nigeri
- Mandakini
- Pindar
- Mandakini
- Nayar (east and west)

### Remark

#### The Mandakini system
- Gabini
- Byum
- Paun
- Dharma
- Laster

#### The Alaknanda system
- Peaks near Satopanth glacier
- Rudranath
- Tungnath
- Pindari
- Kedarnath

### On the Sources of Ganga

Ganga, whom the people of India worship as divine mother, has nurtured her children now for a few millennia. From time immemorial her banks have been the granaries of Bharatvarsha. Among the rivers of the world, she occupies a rare and unique position. No other river equals her in veneration in which she is held — a distinction unheard of in the annals of history.

Ganga rises on the opposite sides of the Chaukhamba massif. Her sources are the Gangotri glacier (3,892 metres/12,770 feet) and the Satopanth and the Bhagat Kharak glaciers (3,749 metres/12,300 feet). The rivers, Bhagirathi and Alaknanda flow in opposite direction from these sources — the first westward and the second eastward. Their early passages are through U-shaped longitudinal valleys. Gradually, Bhagirathi turns south-eastward and Alaknanda south-westward. On their way, the former collects Bhillanganga and the latter Mandakini — a river which has steepest descent (115 metres/kilometre or 604 feet/mile in its first 16 kilometres or 10 miles) in this part of the Himalayas. They meet at Deoprayag to become Ganga. Does this bare outline settle the question of her origin? Let us hear Sir John Strachey:

"The greatest rivers of India all come from the Himalaya. It is remarkable that, although their courses through India to the sea are so widely divergent, their chief sources are not far apart from each other, and they all lie beyond the Indian watershed. They are in the high Tibetan plateau near the lake of Manasarovar and the peak of Kailas, names among the most sacred of Hindu mythology. This is strictly true of the Indus, the Sutlej, and the Brahmaputra, and although the Ganges seems to be an exception, it can hardly be said to be one."
"Almost every work on the geography of India still tells us that the Ganges has its origin in the glacier, or, as it is oftener and inaccurately called, the snow-bed of Gangotri, where it issues from the ice-cave, the 'cow's mouth' of the sacred books of the Hindus. The truth is that, apart from mythology and religion and common belief, ..., Gangotri has no claim to be called the source of the Ganges. The river which comes from Gangotri is the Bhagirathi, one of the numerous Himalayan feeders of the true Ganges, into which it falls about forty miles above Hardwar, where the Ganges enters the plains of India. The main stream is that of the Alaknanda, which has a much longer course and a much larger body of water than the Bhagirathi; its most distant sources are on the southern side of the watershed, near the Niti and Mana passes into Tibet, and it collects the drainage of the peaks and glaciers of the Kumaon and Garhwal Himalaya, from Nanda Devi to the sacred shrines of Badrinath and Kedarnath. But the Ganges, like the Indus, the Sutlej, and the Brahmaputra, has also its trans-Himalayan sources. The Gogra, or more correctly the Ghagra, which joins the Ganges above Patna, about 500 miles from the sea, is hardly known to European fame, but in the upper portion of its course it is a much larger river than the Ganges. It rises on the north of the Indian Himalaya; not far from the sources of the other great rivers, near the lake of Manasarovar, finds its way through the mountains of Nepal, under the name of Kauriiali, and flows on through Oudh until it joins the Ganges. The Kauriiali, near the borders of Nepal, after it has entered the plains, is said to have a minimum discharge of 11,000 cubic feet per second, whereas that of the Ganges at Hardwar is only 6,300 feet. Whether at the junction between the Ganges and the Gogra, the former, after its longer course through the plains of India, has become the larger stream, is a question to which no certain answer has hitherto been given; but it is curious that it should still be possible to doubt whether the Gogra can properly be called an affluent of the Ganges, and whether it ought not rather to be held that the Ganges, in its passage from the mountains to the sea, falls into a river greater than itself, the very name of which is hardly known in Europe."  

The Lesser Himalayas

The ranges of Nagtibba and Mussoorie, which we met earlier in the state of Himachal Pradesh continue their strikes and enter the state of Uttar Pradesh. On the hills of these ranges we find the townships of Nagtibba and Mussoorie. (See the road map of Jamnotri-Gangotri.) Obviously, they lend their names to these ranges. The names apart, are the strikes clearly discernible? To answer this question we refer to Mason. He wrote:

"Second, the Lesser Himalaya, a complex older zone, averaging perhaps sixty mile wide, with the same general 'strike' as the Siwaliks, but more contorted by uplift, occasionally forced to change direction, and intensely carved by erosion and mountain torrents: great limestone ridges, sometimes showing their original alignment and parallelism, but more often now appearing as spurs from a crystalline core of a range north of them. It is a zone where whole hillsides may crumble and disappear after heavy rain, destroying mountain paths and bridges. Dense tropical forests cover the lower slopes of these mountains in the east; westwards their place is increasingly taken by magnificent coniferous forests, pride of all being the deodor ... On the outer fringe of the Lesser Himalaya, facing the Indian plains, are the man-made hill stations, at altitude of from 5,000 to 7,000 feet, ..., Mussoorie, Ranikhet, Almora and Nainital." 29
The description of this contorted topography is not so simple. In spite of it, we must single out three minor ranges which form great divides between the rivers of this zone. These are: (1) the Gangotri-Jamnotri range, (2) the Mandakini range and (3) the Tungnath range. The first one begins from the Bandarpunch mountain, goes along the river Jamuna, keeping the stream to its west, and then turns a little to the east and takes its direction towards Rishikesh. It is clearly a divide between the rivers Jamuna and Bhagirathi and the Dharasu-Barkot road goes over it. From the crest of it a grand view of the Bandarpunch range is obtained. The second one starts from the Kedarnath mountain, takes its strike towards Tehri and ends at Deoprayag. It is a zonal divide between the rivers Bhagirathi and Mandakini. The third one comes out of the Badrinath mountain itself and goes on to Tungnath and finally reaches the bed of Alaknanda between Karnaprayag and Rudraprayag. Obviously, the range is a divide between the Mandakini and Alaknanda basins.

We have come to the end of our study of the Badri-Kedar mountain block. It is but natural to ask: what have we gained from such a long deliberation? The answer is: it is helpful in several ways. To cite an example we consider the pathways between the holy places. The one between Jamnotri and Gangotri through the mountain passes is possible because the former is on the outskirts of the Dhauladhar range. The other between Gangotri and Kedarnath is impossible because the temple of Gangotri is entrenched between the high walls of two very long mountain ranges — the low lying passes are not available for short cuts. Similarly, there is no way from Kedarnath to Badrinath because the high walls of mountains and dense forests intervene. Shipton and his party made their way from Badrinath to Madhmeshwar at the risk of their lives. They got lost in the dense forests and came out of the nightmare after seven days. How far these forests are dense now I do not know.

There is one very well-known path between Gangotri and Badrinath. It is not a short cut for all but is frequented by mountaineers and some sadhus. It is over the Chaturangi glacier and the Kalandani pass — not a low one. The trek is then along the Arwa river and leads to Ghastoli which is on the Mana-Badri route. This short cut becomes possible because the axis of the Great Himalayas can be by-passed and the route is from the same side of the mountain ranges.

**Kamet Mountain Block**

Here, the Zaskar range delimits the boundary between India and Tibet. Thus, we enter a sensitive border region for which maps are not available. Hence, at times, I shall possibly be in error. Also, this section should be regarded as tentative.

The Kamet region is neatly enclosed by the Zaskar range in the north and the rivers Saraswati and Vishnuganga in the west and the river Dhauliganga in the east. It is a compact area in which there are very many high mountain ridges and plenty of glaciers. It boasts of the Valley of Flowers. To its north is Bhyundar Khanta, a pass, which leads to the Banke glacier. An early map prepared by Longstaff serves our purpose and Mason’s sketch of ridges and glaciers north of the Rataban mountain fills in the gaps adequately. These are given in Map 14 & Fig. 20.
MAP 14. GARHWAL, NORTH

FIG. 20. GLACIER APPROACHES TO THE KAMET GROUP
Further an area marked by two very high ridges (see Longstaff's map) is sketched by R. A. Gardiner and is given below.

![Map of Banke Glacier and Eri Udiar Region]

**FIG. 21. BANKE GLACIER AND ERI UDIAR REGION**

These sketches and the map are our only resources from which we draw our information. We give below the summits and the glaciers.

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<th>Height (Feet)</th>
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<td>Durpata</td>
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</table>
Glaciers

**The Saraswati Basin**
- Tara Bank
- Balbalna Bank
- Uttari Chamrao
- Dakshini Chamrao
- Paschimi Kamet
- Khaiam
- Ghastoli
- Khular Bank

**The Dhauliganga Basin**
- Raikane
- East Kamet
- Banke
- Kosa Kumar Bank
- Raj Bank
- Tipra Bank
- Juma
- Goda Bank

The rivers from these glaciers are mere feeders and are so small that they deserve place only on a drainage map of the region. Some of them are found in Longstaff’s map and they join either Saraswati or Dhauliganga.

**Nanda Devi Mountain Block**

Once the Nanda Devi peak along with its mountainous zone was the most romantic place in the whole of Himalayas. When the explorers were camping round Mount Everest, K2, Kangchendzonga and Nanga Parvat — world’s renowned high peaks - mountaineers were seeking routes to this undisputable Queen of Snows. Thus, she reigned supreme in all Himalayas.

The story of Nanda Devi is a story of high adventure. It is much more remarkable than most saga because she is just seen from anywhere in Kumaon — almost within an arm’s reach. Nainital, Ranikhet, Almora, Gwaldam and many other hill stations offer a grand and close view of her. Yet, she was the most elusive mountain of all mountains. Gurudev Rabindranath Tagore, the Nobel-prize winning poet of India, who saw this mountain block from Almora, wrote:

"O Silent King of Snows
Sky-piercing is thy Music."

To catch a few faint notes from this mountain block or to get even a glimpse we focus the range here.
This block is also known by its alternative name — the Nanda Devi sanctuary. It is the most appropriate name for the region because it forms a natural sanctuary. Longstaff, who as early as the first decade of this century, climbed Trisul, wrote:

"From these old maps it could be seen that the basin of Nanda Devi presented unique difficulties of access. It is doubly barred from the outer world by a wall within a wall. The highest and western peak (25,660 feet) rises from the centre of two concentric amphitheatres resembling two horseshoes placed one within the other and touching each other at the toe. Where the toes of the two horseshoes overlie one another is Nanda Devi East (24,379 feet). From this springs a wall, two miles long and 23,000 feet high, to rise abruptly to the higher western peak. Thus Nanda Devi itself projects right out into the centre of the inner horseshoe dominating the Sanctuary and rising a sheer 10,000 or 12,000 feet above the glaciers at its base. The outer amphitheatre, or horseshoe, measures seventy miles in circumference and from its crest rise a dozen peaks of over 20,000 feet, including Trisul and Dunagiri as well as Nanda Devi East. For sixty miles of this distance there is no depression below 17,000 feet, and not even the rim of this barrier had ever been reached by any human foot. Down the centre of these two concentric horseshoes the Rishiganga rushes to meet the Dhauli river, at Rini, only 6,000 feet above sea level. Its whole course is not twenty miles. Unexpectedly this gorge of the Rishi offers no practicable way of access into its basin of some 250 square miles, which has in consequence never been inhabited; in fact no one has yet traversed the whole course of the river. ... But every summer the shepherds of Tolma drive a few sheep and goats over the lower end of the outer horseshoe, three miles above Rini, in order to pasture them for two months in the little side glen of Dibrugheta which hangs high above the northern bank of the Rishiganga. It was by this side door, at a height of 14,700 feet that Graham had entered, to be the first man to reach the haunted Rishiganga. But the inner sanctuary defeated him."  

For another two decades explorers failed to solve the mystery and in 1932 Hugh Rutledge wrote:

"Nanda Devi imposes upon her votaries an admission test as yet beyond their skill and endurance; a seventy-mile barrier ring, on which stand twelve measured peaks over 21,000 feet high, which has no depression lower than 17,000 feet — except in the west, where the Rishi Ganga River, rising at the foot of Nanda Devi, and draining an area of some two hundred and fifty square miles of snow and ice, has carved for itself what must be one of the most terrific of gorges in the world. Two internal ridges, converging from north and south respectively upon this river form, as it were, the curtains of an inner sanctuary within which the great mountain soars up to 25,600 feet. ...

Finally, in 1934, Shipton and Tilman forced a passage through the Rishi gorge and set foot within the privileged inner sanctuary for the first time. Shipton wrote:

"For more than fifty years it had been the unaccessible goal of explorers who, attracted by the impregnability of its surroundings, had failed in repeated attempts to reach even its foot, the reason being that around the 25,660 feet mountain itself stretched a huge ring of peaks, more than thirty of them over 21,000 feet high, that constituted themselves unrelenting guardians of the great mountain and defeated any penetration."

Tilman and Odell climbed Nanda Devi in 1936. Thus ended this adventure.
In the foregoing narrations only one point is stressed again and again—the impenetrability of the mountain ring. To bring out this aspect of the sanctuary we present a sketch drawn by Mason.

**FIG. 23. THE NANDA DEVI SANCTUARY AND ITS APPROACHES**

The sketch shows the complexity of the mountain ring. The Nanda Devi mountain is inside. The approach to it is by the way of a terrific gorge of the river Rishiganga which is seen right in the middle. We give now the sectional details of this ring. The first to follow is the environs of Rishi. The next to it is the Lampak mountains which are north of the Dunagiri mountain and the Bagani glacier. Then come the Uja Tirche horseshoe and the Girthi river.

**MAP 15. THE RISHIGANGA RIVER**
MAP 16. THE LAMPAK MOUNTAINS

MAP 17. UJA TIRCHE HORSESHOE
These four sketch maps serve as convenient zones for grouping of mountains and glaciers in the Nanda Devi mountain block. The region around the Girsthi river is right on the Indo-Tibetan border and once more we face the same problem as before. We overcome it by skipping the region. For the rest of the zones we have the necessary data and we present them here.

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(30°, 30', 57")
79°, 52', 4")
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Heights in metres are from the Survey of India maps.

Most of the peaks are above 20,000 feet, but there are only two peaks in the ring which are more than 23,000 feet. We single them out. The one is Dunagiri, which is more or less a range in the northern part of the ring. The other is Trisul, which along with Nandakana (Nanda Ghungti) forms a range in the southern part. These two ranges are illustrated below by Gansser’s sketches.
FIG. 24. View of the DUNAGIRI GROUP from the KUARI PASS, 11,808 feet. Sketched from nature by A. Gansser.

FIG. 25. View of the TRISUL-NANDAKANA GROUP from GWALDAM, 6560 feet, on the ALMORA-GARHWAL border. Sketched from nature by A. Gansser.
The most romantic place in the whole Nanda Devi mountain block is the sanctuary where the Queen of Snows, Nanda Devi, sits on her majestic throne. Within the northern part of the sanctuary are the glaciers of Uttari Nanda Devi Bank, Uttari Rishi Bank, Changabang Bank, Ramni Bank and Hanuman Bank. Of these, the first three glaciers are interconnected and give rise to the northern feeder of the Rishiganga river. Within the southern part of the sanctuary are the glaciers of Dakshni Nanda Devi Bank, Dakshni Rishi Bank, Trisul Bank, Bethartoli Bank, Raunthi Bank and Nanda Ghungti Bank. In this group, the first two are interconnected and give rise to the southern feeder of the Rishiganga river. The two feeders meet in the middle of the sanctuary and form the Rishiganga river. The river collects a stream called Bagni Gadhera from Ramani Bamak at Ramni. A little further from this place joins the Trisul-Nala river from the glacier Trisul Bamak. The river flows down then to Rini where it falls into a bigger river Dhaulik which comes from the Indo-Tibetan border.

Outside the sanctuary are the glaciers of Milam and Pindari. The former is 19.2 kilometre (12 mile) long and is the origin of the river Goriganga. The latter is a well-known glacier and needs no introduction. It is the oft-visited place by trekkers and travellers. A sketch of it by Gansser is given below.

![Pindari glacier](Image)

**FIG. 26. PINDARI GLACIER, KUMAON HIMALAYAS; after A. Gansser (1939)**

<table>
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<th>Remark</th>
<th>Outside of the sanctuary (clockwise direction)</th>
<th>Remark</th>
</tr>
</thead>
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<tr>
<td><strong>The Lampak zone</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghalon Gal</td>
<td></td>
<td>Gankhwi Bank</td>
<td>North of the sanctuary</td>
</tr>
<tr>
<td>Lampak Gal</td>
<td></td>
<td>Dunagiri Bank</td>
<td></td>
</tr>
<tr>
<td>Sirapunch Gal</td>
<td></td>
<td>Bangni Bank</td>
<td></td>
</tr>
<tr>
<td>Kalla Bank</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

100
<table>
<thead>
<tr>
<th>Outside of the sanctuary</th>
<th>Inside of the sanctuary</th>
</tr>
</thead>
<tbody>
<tr>
<td>(clockwise direction) (contd.)</td>
<td>(clockwise direction)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location</th>
<th>Remark</th>
<th>Location</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milam</td>
<td>West of Milam glacier</td>
<td>Hanuman Bank</td>
<td>North part of the sanctuary</td>
</tr>
<tr>
<td>Mangron</td>
<td></td>
<td>Ramni Bank</td>
<td></td>
</tr>
<tr>
<td>Pachhmi Bamchhu</td>
<td></td>
<td>Changabang Bank</td>
<td></td>
</tr>
<tr>
<td>Syakaram</td>
<td></td>
<td>Uttari Rishi Bank</td>
<td></td>
</tr>
<tr>
<td>Timphu</td>
<td>West of the Goriganga river</td>
<td>Uttari Nanda Devi Bank</td>
<td></td>
</tr>
<tr>
<td>Pachhu</td>
<td></td>
<td>Dakshni Nanda Devi Bank</td>
<td>South part of the sanctuary</td>
</tr>
<tr>
<td>Nanda Ghungti</td>
<td></td>
<td>Dakshni Rishi Bank</td>
<td></td>
</tr>
<tr>
<td>Gwa</td>
<td></td>
<td>Trisul Bank</td>
<td></td>
</tr>
<tr>
<td>Shalang</td>
<td></td>
<td>Bethartoli Bank</td>
<td></td>
</tr>
<tr>
<td>Kwalgang</td>
<td></td>
<td>Rauntli Bank</td>
<td></td>
</tr>
<tr>
<td>Burphu</td>
<td>East of Goriganga</td>
<td>Nanda Ghungti Bank</td>
<td></td>
</tr>
<tr>
<td>Peting Gal</td>
<td>South of the sanctuary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramganga</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pindari</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chhangunj</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buria Gal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burh Gal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mangtoli Gal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrighthuni Gal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bidalgwar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sili Samudra</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The main rivers which arise around the Nanda Devi mountain block are: Goriganga, Pindari, Nandakini, Birahiganga and Dhauliganga. Among these, the first one belongs to the Kali river system and is taken up in the following paragraph. Of the others, the Dhauliganga river belongs to more than one region. It has its sources near the Niti pass in the Kamet region and is fed through the Girthi river by the glaciers of the Lampak group. The Bangni and the Dunagiri glaciers too contribute waters to it. The Rishiganga river is its main tributary. Yet, to say the least, it is one of the sources of the Alaknanda river and rightfully belongs to the Alaknanda river system. The remaining three rivers, Pindari, Nandakini and Birahiganga, as mentioned earlier, flow down into the Alaknanda basin.

The Goriganga river originates in the Milam glacier. It is fed by small streams which come from equally small glaciers. The rivulets Lwa Gad and Shalang Gad flow from the Gwa and the Shalang glaciers and form Martoli Gad at Lwa and continue down to meet the river Goriganga at Martoli. Similarly, the feeders Gonkha Gad and Burphu Gad come from the east side of the Goriganga river and meet it on its way to the Kali river. This river is fed by many glaciers of the Panch Chuli mountains but these fall outside the present block.

The rivers which do not originate around the Nanda Devi mountain block are Ramganga and Nayar. They belong to the Lesser Himalayas in the Kumaon division. Of these, the two Nayar rivers fall into Ganga and the river Ramganga forms a separate basin of its own.
Rivers

**The Alaknanda system**
- Dhauliganga
- Girthiganga
- Rishiganga (or Riniganga)
- Ganeshganga
- Birahiganga
- Nandakini
- Pindar
- Bhaiganga
- Kelganga
- Talor
- Goptara
- Bhawari
- Taligar
- Nayar
- Pasin
- Kota
- Chhau
- Pan
- Kul

**The Ramganga system**
- Ramganga
- Sura
- Mandal
- Palayan
- Khoh
- Malan
- Khasan
- Vidasan

**The Goriganga system**
- Goriganga
- Pachhu Gad
- Martoli Gad
- Lwa Gad
- Shalang Gad
- Gonkha Gad
- Burpho Gad and feeders from the glaciers of the Panch Chuli group of mountains.

**The Lesser Himalayas**

The Kumaon division was once the most densely forested part of India. Its beauty attracted the attention of many well-known travellers. Of this the tourists will speak later. For the present, we consider some mountain ranges which play important role in the overall topography of the region.

**The Ramni Range**

It is a divide between the rivers Birahiganga and Nandakini. The range seems to start from Trisul and ends a little north of Nandaprayag. (See the tourist map).

**The Khamil Range**

This range is almost parallel to the previous one. It seems to begin near Rup Kund and ends at Karnaprayag (see map). It separates the Nandakini river zone from the Pindar river zone.

**The Gwaldam Range**

The range is a long one and should be called Nandakot-Gwaldam-Dudatoli range. It appears to arise near Nanda Kot and runs parallel to the Khamil range. It remains a little south of Dhakuri and Gwaldam (see map) and seems to join here the Dudatoli range which reaches right up to Pauri and beyond to Deoprayag. It is a divide between the Alaknanda basin and the Ramganga basin.

**The Dhanpur Range**

A branch at the junction of the Gwaldam and the Dudatoli ranges, the ridge goes south-west towards Pauri. It divides the Nayar region from the Alaknanda region. The Nayar river meets Ganga (and not Alaknanda) a way below Deoprayag.
Panch Chuli Mountain Block

This is our last mountain block in the Garhwal Kumaon division. It brings us right up to two international boundaries. In the north, between Kungribingri La and Lipulekh, is the Indo-Tibetan border and in the east, along the Kali river is the Indo-Nepalese border. These two international boundaries doubly bar us from gaining any knowledge of the region. A map shows that the zone is practically covered with glaciers. But without proper maps, it is impossible to name any glacier or say anything about the place. In the circumstance I present here two sketch maps — the one is of the Panch Chuli mountain block and the other is of the zone north of it.

MAP 20. FROM THE RALAM PASS TO PANCH CHULI

MAP 21. THE RALAM PASS
### Mountains and Peaks

<table>
<thead>
<tr>
<th>Mountains</th>
<th>Peak</th>
<th>Height</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panch Chuli</td>
<td></td>
<td>6904</td>
<td>22,652</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6312</td>
<td>20,710</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6334</td>
<td>20,782</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6437</td>
<td>21,120</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6072</td>
<td>19,922</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6041</td>
<td>19,821</td>
</tr>
</tbody>
</table>

Heights in metres are from the Survey of India maps.

### Glaciers

**West of Panch Chuli**
- Uttar Balati Gal
- Dakhni Balati Gal
- Panch Chuli Gal
- Bainty Gal
- Rula Gal
- Kulka Gal
- Jimba Gal

**East of Panch Chuli**
- Sona Gal
- Meola Gal
- Chipa Gal

The river Kaliganga has two widely separated sources: the eastern headwater, which is a collection of springs, is called Kalapanji; the western headwater, which is a vast snow field, goes by the name of Kuthi Yanaki. The river has a rapid course within its first 10 kilometres (6.25 miles) and its very steep gradient almost matches with that of the river Mandakini. At Khela, a little north-east of Dharchula, it is met by an equally big tributary Daramaganga. The waters of combined torrents are further augmented by the river Goriganga at Jauljibi, which too has the same gradient as that of Mandakini. The river continues its course to Pancheswar where its confluence with the river Sarju is celebrated. Sarju has two tributaries which meet at Raneshwar, a little northwest of Pancheswar. Lohawati and Ladhiya are two more torrents which further broaden its course. The river enters the plains at Baramdeo and the course is then known as the Sarda river.

The ranges of the Lesser Himalayas form divides between the tributaries of the river Kaliganga. The one, which runs from Nanda Kot to Pithoragarh, separates the Goriganga region from the Sarju region. The other, which is an offshoot of the above range, goes towards Raneshwar and becomes a divide between the two Sarju tributaries. These ranges were once densely forested. I do not know their present condition and I leave the discussion at this point.
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15. Gordon Osmaston, op cit, p. 129
17. Kenneth Mason, op cit, p. 265
26. A. Heim and A. Gansser, op cit, p. 191
27. A. Gansser, op cit, p. 113
28. John Strachey, op cit, p. 22
29. Kenneth Mason, op cit, p. 4
30. T. G. Longstaff, op cit, p. 106
31. Kenneth Mason, op cit, p. 119

106
34. T. G. Longstaff, op cit, p. 65
35. H. W. Tilman, op cit, p. 22
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37. Kenneth Mason, op cit, p. 116
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39. ibid., p. 52
40. W. H. Murray, op cit, p. 161
41. ibid., p. 188
42. A. Heim and A. Gansser, op cit, at end of volume, see panoramic sketch (c).
43. ibid., see panoramic sketch (b).
44. A. Gansser, op cit, p. 113
45. A Sketch Map from a brochure — Naini Tal ... Pithoragarh U. P. Tourism, Lucknow.
46. Thomas Weir, op cit, p. 87
47. W. H. Murray, op cit, p. 223
PART III
FLORA AND FAUNA OF
THE GARHWAL
KUMAON HIMALAYAS
"A flower is one of nature's joyous expressions of an all-pervading cosmic power. It lifts a song of the sun and brings to the face of the earth a complexion of youthfulness and vitality."\(^1\)

- F. S. Smythe
1. SOIL AND CLIMATE

The flora and fauna of any countryside depend upon its general topography, soil and climate. In the preceding chapter, we studied the topography of the famous Uttarakhand. In the present chapter, we study its soil and climate.

Soil

A layman is hardly interested in soils of his own countryside — much less would he take interest in soils of distant mountainous terrains. Very little work is done on the Himalayan soils and a passage or two from a book would suffice to gather the necessary information.

"Soils of the Himalayan region do not form a compact block. In texture, colour, humus, mineral contents and other lithological and ecological conditions the soils differ from valley to valley and slope to slope. In upper reaches the soils are, however, fluvioglacial in origin. On talus fans and flat terraces silty to clayey loams are found. Brown forest soils are widely found in many parts of the region. On forest margins (Katil) the poor soils are extremely immature and stony. On hill sides (Upraon) gravelly and sandy loam soils are found. On the flat valley bottoms (Talaon) brown soils with clayey texture are found.

"The bhabhar (porous) and Tarai tracts are covered with entirely different soils. The Tarai part is overlain with rich clayey soils with contents of rich humus, moisture and sand, whereas the bhabhar area is covered with gravel-infested, highly porous, aerated and moisture-retaining soils. Both these parts are thickly forested and also contain marshy and swampy patches."2

Minerals

The mineral wealth of Uttarakhand is illustrated below by a small sketch.

![Minerals (Uttarakhand)](image)

Antimony (Chamoli), Arsenic (Garhwal), Asbestos (Chamoli), Byrite (Almora and Tehri Garhwal), Dolomite (Tehri Garhwal, Dehradun, Almora), Gold (river waters), Graphite (Almora), Gypsum (Dehradun, Tehri Garhwal), Mica (Garhwal), and radioactive elements like Uranium (Chamoli) are mineral deposits of the Garhwal Kumaon division of Uttar Pradesh. How rich these deposits are and whether the ores can be economically exploited, I do not know.

Uttarakhand was known for its copper and lead ores. These metals were mined during medieval times. The copper-lead belt begins from the river Kali and passes through the districts of Tehri Garhwal and Dehradun. Shisakharin (Pithoragarh), Gwar (Chamoli) and Pindi (Tehri Garhwal) have shown wide occurrences of copper-lead carrying veins. During the last century, attempts were made by foreigners
to exploit the iron deposits of the Kaladunghi (Nainital) area, but these failed on account of poor quality of the ores. Today, limestone is mined in the districts of Almora, Pithoragarh, Dehradun and Tehri Garhwal. Huge deposits of these stones are found in Nilkantha and Dehradun-Mussoorie tracts. Phosphatic shale or rock phosphate is also found in some areas of Dehradun and Garhwal. Magnesite, a refractory material used in iron and steel industry, occurs widely in Almora.

Climate

Anyone who has stayed in mountains knows how unpredictable the weather is. He can expect in a single day sunshine, rains, electrical storm, hailstorm or a foggy weather. In short, he goes through all possible weather conditions in just 24 hours. This might appear fantastic to outsiders who live in plains or coastal regions. But this is the fact of life in mountains.

For me, who has not lived in the Himalayas for more than 14 days, it is difficult to give an adequate idea of weather in Uttarakhand. In this connection books too are of little help. One, which is written by a galaxy of Indian geographers and published as late as 1971, has the following to say: "So far, there has been no systematic survey of the climate of the Himalayan region." If this is the state of affairs in the 20th century India, I would like to warn my readers to take my data here with due caution.

The mountains of Garhwal Kumaon Himalayas present so many climatic variables that a careful study of the weather is warranted. This requires a large number of meteorological stations to gather data from the entire countryside. Whether such well-equipped stations exist in the region I cannot say. What I can say is this: due to complicated relief of the land, microclimatic conditions are common and are observed throughout the year. From valley to valley and town to town these conditions vary and depend on (i) the direction of ridges, (ii) degree of slope, (iii) sunny or shady aspect of slope, (iv) density of forest cover and (v) closeness to glaciers. In winter, heavy fogs in wide valleys and high winds in narrow valleys are the conspicuous features of the weather. Snowfall, which is caused by winter depression, is quite common. It occurs for at least seven to eight days in each of the three months from January to March. Thunderstorm or electrical storm occasionally accompanied by hailstorm arises in the months of April and May. From the middle of May the pilgrim season begins which lasts right up to the end of June and beyond. During this period, just before the break of monsoon, convection rain begins to fall in the afternoons mostly at the higher altitudes. Although the rainfall is scant (12 to 25 millimetre or 0.5 to 1.0 inch), it rains almost everyday, if not, every third or fourth day. The monsoon arrives towards the end of June or the beginning of July. It lasts until the middle of September. The maximum precipitation, both in summer and winter, is in the zone which lies between 1,200 and 2,100 metres (3,937 and 6,890 feet). The summer rainfall is specifically less for the zones above 2,400 metres (7,874 feet). The marked differences in the rainfall in the front and rear of the main range deserve special mention. It means that the precipitation at a place depends not only on its altitude but also on its location. Between June and September the average rainfall in the frontal zone amounts to 37-50 cm (15-20 inches). In the rear zone it is just 20-25 cm (8-10 inches). Snowfall in winter, between the months of November and May comes to three to five metres (10 to 16 feet).

Tables 1 to 3 illustrate the rainfall in the region. The first one shows the altitude dependence of the rainfall. The second one shows the departure from the first table due to location. The third one gives monthly rainfall or precipitation for a number of stations. The table contains data from the last century when the region abounded in virgin forests.
TABLE 1

Variation of Rainfall with Altitude

<table>
<thead>
<tr>
<th>Elevation from sea-level</th>
<th>Rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feet</td>
<td>Metres</td>
</tr>
<tr>
<td>800</td>
<td>244</td>
</tr>
<tr>
<td>1,000</td>
<td>305</td>
</tr>
<tr>
<td>2,000</td>
<td>610</td>
</tr>
<tr>
<td>3,000</td>
<td>914</td>
</tr>
<tr>
<td>4,000</td>
<td>1,219</td>
</tr>
<tr>
<td>5,000</td>
<td>1,524</td>
</tr>
<tr>
<td>6,000</td>
<td>1,829</td>
</tr>
<tr>
<td>7,000</td>
<td>2,134</td>
</tr>
<tr>
<td>8,000</td>
<td>2,438</td>
</tr>
<tr>
<td>9,000</td>
<td>2,743</td>
</tr>
<tr>
<td>10,000</td>
<td>3,048</td>
</tr>
<tr>
<td>11,000</td>
<td>3,353</td>
</tr>
<tr>
<td>12,000</td>
<td>3,657</td>
</tr>
</tbody>
</table>

In the table the maximum rainfall is observed at 1,219 metres or 4,000 feet.

TABLE 2

Local Variation of the Rainfall

<table>
<thead>
<tr>
<th>Station</th>
<th>Height</th>
<th>Rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metres</td>
<td>Feet</td>
</tr>
<tr>
<td>Stations on the edge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Narendranagar</td>
<td>1,080</td>
<td>3,543</td>
</tr>
<tr>
<td>Dehradun</td>
<td>682</td>
<td>2,238</td>
</tr>
<tr>
<td>Nainital</td>
<td>1,934</td>
<td>6,345</td>
</tr>
<tr>
<td>Stations in the interior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deoprayarag</td>
<td>457</td>
<td>1,499</td>
</tr>
<tr>
<td>Srinagar</td>
<td>550</td>
<td>1,805</td>
</tr>
<tr>
<td>Tehri</td>
<td>778</td>
<td>2,553</td>
</tr>
<tr>
<td>Karnaprayag</td>
<td>884</td>
<td>2,900</td>
</tr>
<tr>
<td>Pithoragarh</td>
<td>1,636</td>
<td>5,368</td>
</tr>
<tr>
<td>Almora</td>
<td>1,676</td>
<td>5,499</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----------------</td>
<td>------</td>
</tr>
<tr>
<td><strong>Bhabar, Siwaliks and Duns</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haldwani</td>
<td>1,430</td>
<td>1.40</td>
</tr>
<tr>
<td>Hardwar</td>
<td>1,100</td>
<td>2.98</td>
</tr>
<tr>
<td>Dehradun</td>
<td>2,230</td>
<td>2.06</td>
</tr>
<tr>
<td>Kalsi</td>
<td>2,000?</td>
<td>2.21</td>
</tr>
<tr>
<td><strong>Outer Ranges</strong></td>
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</tr>
<tr>
<td>Nainital</td>
<td>6,600</td>
<td>3.04</td>
</tr>
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<td>Mussoorie</td>
<td>5,850</td>
<td>2.48</td>
</tr>
<tr>
<td>Mussoorie</td>
<td>6,550</td>
<td>2.00</td>
</tr>
<tr>
<td>Chakrata</td>
<td>7,052</td>
<td>1.41</td>
</tr>
<tr>
<td>Landaur</td>
<td>7,511</td>
<td>2.47</td>
</tr>
<tr>
<td><strong>Inner Ranges and Valleys</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Champawat</td>
<td>5,550</td>
<td>2.12</td>
</tr>
<tr>
<td>Pithoragarh</td>
<td>5,500</td>
<td>1.72</td>
</tr>
<tr>
<td>Almore</td>
<td>5,490</td>
<td>1.88</td>
</tr>
<tr>
<td>Ranikhet</td>
<td>6,069</td>
<td>1.64</td>
</tr>
<tr>
<td>Pauri</td>
<td>5,350</td>
<td>2.61</td>
</tr>
<tr>
<td>Srinagar</td>
<td>1,750</td>
<td>2.20</td>
</tr>
</tbody>
</table>
Another important climatic parameter besides rainfall is temperature. It too depends on the height and the location of a place. For its study we define the following zones:

1. **The zone of perpetual snow**

   Here the temperature is always below zero degree centigrade, and the height is above 4800 metres (15,749 feet). Obviously, the region is devoid of any vegetation.

2. **The glacial zone**

   This falls between 4,000 and 4,800 metres (13,124 and 15,749 feet). The temperature remains below zero degree centigrade for ten months of a year but rises by a few degrees above zero in the two summer months.

3. **The alpine zone**

   The climate here is that of Alps. For six months the temperature is below zero degree centigrade but in the months of July and August snow melts and land comes to life with flowers and meadows. The zone is between 3,000 and 4,000 metres (9,843 and 13,124 feet).

4. **The cold zone**

   It lies between 2,400 and 3,000 metres (7,874 and 9,843 feet). The temperature remains below 20°C throughout the year. In monsoon, actually it is springtime.

5. **The cool temperate zone**

   The weather is temperate here. That is, the temperature scarcely goes above 25°C and the region falls between 1,800 and 2,400 metres (5,906 and 7,874 feet).

6. **The warm temperate zone**

   Here the climate is warmer than in the 5th zone but it is neither very hot nor very cold. The temperature ranges between 10° and 30° C. Its elevation comes between 900 and 1,800 metres (2,953 and 5,906 feet).

7. **The tropical zone**

   This is the zone between 300 and 900 metres (984 and 2,953 feet) and the climate is more or less that of plains.

   Temperatures given in Table 4 are for those stations which are mostly located in the 5th and 6th zones. People do not live in the first three zones, and hence, there are no stations for which data could be obtained. Of course, some scientific observatories might be located there but I am unaware of them. From the table we can make one rough deduction, namely, for every 1,000 feet rise there is a drop of 3°F. Compare the two Mussoorie stations.

   Hailstorms in mountains are not ordinary ones. "On 11th of May 1855, a hailstorm occurred at Naini Tal in which many stones of 6, 8, 10 and even 24 ounces were observed to fall, the circumference of these varying from 9 to 13 inches."
<table>
<thead>
<tr>
<th>Station</th>
<th>Elevation in feet</th>
<th>Lat N</th>
<th>Long E</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>June</th>
<th>July</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
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REFERENCES

2. Sukhdev Singh Chib, Uttar Pradesh, Light and Life Publications, New Delhi, 1978, p. 45
3. ibid., p. 46
7. E. T. Atkinson, op cit, p. 251
8. ibid., p. 211
2. FLORA

In the upper reaches, the Himalayan forests attain their true magnificence. They significantly differ from the forests of lower altitudes and plains. Also they do not resemble the South Indian dense rain forests — so much so that at least two South Indians told me that there are no forests in the Himalayas. Be that as it may, the Himalayan forests too can be very dense, if not as dense as the South Indian ones. None the less the virgin forests in Uttarakhand are rare and it has become difficult to get the true glimpse of even one. However, I still hope that in some rare places such forests do exist and, I believe, no one would remain unmoved by the sight of their beauty. In my case, I cannot claim that I have seen the true virgin forest of the Himalayas. But two forests which I have seen in Uttarakhand were excellent. The one was in the Jamnotri region and the other was in the Kedarnath region. The striking feature of these forests was conifers in shapely order. This pleased the eye and did not overwhelm as does the chaotic green mass of the South Indian forests.

Nowadays tourists see forests around hill stations. Of course, these are in poor condition and the visitors come away with a very bad impression. To correct this unfavourable impression I quote those who had seen Uttarakhand in its true splendour. Arnold Heim, a Swiss, who had trekked in these forests half a century ago had penned the following lines: "Never have I seen such a variety of trees as on this shady side of the Birla Valley. Amid tall, pointed pines, from which hung festoons of wild vines and clematis, were fine specimens of sycamore (Acer), horse-chestnut (Hippocastanum indica), walnut (Juglans regia), oak, yew (Taxus baccata), and ilex, the interspaces being filled with tropically luxuriant bamboo-grooves".

R. L. Holdsworth, an English mountaineer and botanist, who had participated in the Kamet expedition and had identified the flora of the Valley of Flowers, gave his impression of these forests as he came down from those great heights: "Now we are down to the tree-line: first sprawling, aromatic junipers and bigger bush rhododendrons, then the graceful, white-barked birch trees, and then the outliers of the main conifer forest - the dark gothic spires of silver fir (Abies) and spruce (Picea). Lower down we may find ourselves in an area of Christmas-tree-like blue pine or of the great Himalayan cedar, or deodar, with its flat branches, and upright cones, and, last of the conifers, the massive long-leaved pine which supports a profitable turpentine industry. Gnarled Himalayan oaks of three kinds, and ringal (bamboo) have replaced the brich trees."

The quotations tell us about the varieties of Himalayan trees and their altitudinal distribution but do not tell us anything about the denseness of the forest cover. To get some idea of the thickness of forests we refer to old gazetteers. Atkinson in 1882 wrote: "In many parts of the country they [conifers] occur in unbroken masses extending over many miles and present a scene of magnificent grandeur unknown elsewhere. Each species has its own peculiar beauty, but perhaps the wide-spreading cedar with its branches almost reaching to the ground is the finest and well deserves the epithet 'divine tree' given to it by the old Hindu poets and still in common use to designate it from Kashmir to the Ganges." Further, Colonel Pearson said: "It would be difficult adequately to describe the enormous seas of Chir forest which line its [Jamuna or Tons] bank. In these the trees must be numbered not by thousands but by hundreds of thousands, and many of them are of huge size."
These descriptions assure us of the past luxuriance of Himalayan forests but enough is not enough when the Himalayas are concerned, and hence, I quote again the gazetteer: "The Deoban ridge between the Jumna and the Tons was estimated by Colonel Pearson in May 1869, to contain 34,000 available first-class (deodar) trees and the Bhagirathi forests (excluding the Bhilam valley) 116,700 first-class trees. If to these are added the probable contents of the valleys of the Tons and Jumna rivers, the total number of first-class (deodar) trees available in 1868-69 was about 500,000. The proportion of smaller trees may be gathered from the following estimate of those in the Bhagirathi valley:

<table>
<thead>
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<tr>
<td>First class or above 6' in girth</td>
<td>116,700</td>
</tr>
<tr>
<td>Second class or 4' 6&quot;-6'</td>
<td>53,660</td>
</tr>
<tr>
<td>Third class or 1' 6&quot;-4' 6&quot;</td>
<td>127,536</td>
</tr>
<tr>
<td>Fourth class or below 1' 6&quot;</td>
<td>213,281</td>
</tr>
</tbody>
</table>

This gives a grand total of 511,177 trees—that too of one kind in one zone, namely, deodar in the Bhagirathi valley.

Where are these forests gone? No doubt, the Britishers had exploited them. But they had realised their folly and had devised steps to check further depredation. What did Indians do after their independence? They wrote figures on papers. Forests were 23 percent of India's land in 1947. They vowed to raise the figure to 33 percent. For the Himalayas, the figure was fixed at 60 percent or more. What happened to these figures? In 1981, according to an editorial in the Times of India, the forests have dwindled from 23 percent to 11 percent although the officials maintain that it is 17 percent. Further, the editorial claims that the forests are declining at the rate of 1 percent a year. How could this happen in free India? Obviously, the naturalists were sleeping when there was a nice collusion between the forest officials and the contractors. Otherwise, how could forests disappear in just 20 to 30 years when there are strict rules and regulations for their managements with stringent safeguards?

What is the position of forests in the Himalayas? How could one tell? The official claim ranges from 45 percent to 50 percent of the total land area of the Himalayan districts of Uttar Pradesh. Assuming that this claim is higher by about 10 percent it is reasonable to believe that the available forest cover is about 35 percent.

We name some forests blocks which were once renowned. Among them the Chilla Forest Block around Rishikesh-Hardwar is the most extensive. The forests south of the Bandarpunch range and along the rivers Jamuna and Tons are no mean. The dense growth of vegetation around Madmaheshwar is very striking. Then there are block after block south of the Nanda Devi sanctuary. Their names are:

1. Sundardhunga Reserved Forest,
2. Dhakuri Reserved Forest,
3. Dhanpur Bichla Forest and
4. Dasoli Reserved Forest.

Of course, this list is by no means complete but it gives representative names of some good woodlands. The photograph of Sundardhunga Forest by Shipton gives some idea of the dense cover in the region.

Forest Zones

The Himalayan forests have their own characteristics. The factors which determine and distinguish them are atmospheric, edaphic and biotic. On the basis of various
studies, botanists have established the following forest zones:

(1) The North Indian Tropical Moist Deciduous Forests (below 1,000 metres/3,281 feet).
(2) The North Indian Tropical Dry Deciduous Forests (below 1,000 metres/3,281 feet).
(3) The Himalayan Sub-Tropical Pine (Chir) Forests (1,000 to 2,000 metres/3,281 to 6,562 feet).
(4) The Himalayan Moist Temperate Forests (2,000 to 3,000 metres/6,562 to 9,843 feet).
(5) The Himalayan Dry Temperate Forests (2,000 to 3,000 metres/6,562 to 9,843 feet).
(6) The Sub-Alpine Scrubs and Low Forests (3,000 to 3,500 metres/9,843 to 11,484 feet).
(7) The Alpine Forests (above 3,500 metres/11,484 feet).

We take each of these forests one by one.

1. Tropical Moist Deciduous Forests

The Siwalik ranges, the Bhabar and the Terai areas of the outer Himalayas are the homes of these magnificent forests. Sal takes the pride of place in them and its botanical name, Shorea robusta, conveys its true picture. Among the other species are: Haldu (Adina cordifolia), Shisham (Dalbergia sissoo), Tun (Cedrela toona), Sain (Terminalia tomentosa), Sandan (Dalbergia ooginesis), Kanju (Flacourtia ramantchi), Gutel (Trewia nudiflora), and Khair (Acacia catechu). Bamboos (Dendrocalamus strictus; Bans) and the cane breaks grow luxuriantly along the streams and in the wet hollows. These forests reach up to 800 metres (2,625 feet) on the southern slopes of the mountains and on the northern ones the limit is 1,200 metres (3,937 feet).

2. Tropical Dry Deciduous Forests

The above forests are interspersed by the dry ones wherever the rainfall is scant. Here, the same species grow more or less but the growth is stunted.

3. The Himalayan Sub-Tropical Pine (Chir) Forests

As the name suggests, the main dominant tree of this zone is Pine or Chir. Occasionally we meet some species of the broad-leaved trees but, on the whole, the undergrowth is very poor and the ground surface is covered with various kinds of grasses. The altitudinal limit ranges from 1,000 to 1,900 metres (3,281 to 5,234 feet) on the southern slopes of the mountains and from 900 to 1,800 metres (2,953 to 4,906 feet) on the northern ones.

4. The Himalayan Moist Temperate Forests

The dominant vegetation here is some conifers mixed with broad-leaved trees. Among the latter, oak finds a special favour. The species which abound are: (i) Banj oak (Quercus incana and Quercus himalayansis), (ii) Maru oak (Quercus dilatata) and (iii) Kharshu oak (Quercus semicarpifolia). A common associate is the renowned Bruns or Rhododendron arboreum.
5. The Himalayan Dry Temperate Forests:

The most beautiful conifers of the Himalayas are found in this zone. Their names are as follows: (a) The Himalayan Cedar or Deodar (Cedrus deodara), (b) The Silver Fir (Abies webbiana or Abies pindrow), (c) The Spruce Fir (Picea smithiana), (d) The Blue Pine or The Bhutan Pine (Pinus wallichiana or Pinus excelsa) and (e) The Himalayan Cypress (Cupressus torulosa). The broad-leaved trees are: Acer, Fraxinus and Oak. These trees grow at definite altitudes: the fir and the blue pine flourish between 1,900 and 3,100 metres (6,234 and 10,171 feet) whereas the Himalayan cypress is found between 2,000 and 3,000 metres (6,562 and 9,843 feet) and the famous deodar between 2,400 and 3,050 metres (7,874 and 10,007 feet).

6. The Sub-Alpine Scrubs and Low Forests:

The Birch tree (Betula utilis) is the notable feature of these forests. From time immemorial this tree is known to Indians as 'Bhoorjapatra' and was once used for writing the sacred texts of Hindus. The tracts of it are usually found to the north of the main Himalayan ranges and lie between 3,000 and 3,500 metres (9,843 and 11,484 feet). One such tract lies between Gaumukh and Gangotri and has attracted the attention of many pilgrims. The other feature of the forests is the varieties of shrubs which become evident as one climbs higher.

7. The Alpine Forests:

These forests are actually not forests but pasture lands. They flourish at about 4,200 metres (13,780 feet). In rare cases small pockets are found even higher; however, in all cases Alpine meadows have their own charm and are quite famous. The one called the Valley of Flowers testifies to this and is visited often.

'Bugyal' is the local name for these meadows. It is not wholly devoid of trees; shrubs and bushes grow at random. Among them are Rhododendron campanulatum, Prunus folioloosa and Juniperus recurva. At times stunted pines and firs too are seen.

Flora

The beauty of Himalayan flora matches with the beauty of its mountain scenery. In fact, florals blend so perfectly on the mountain slopes that there is complete harmony. This gives us joy and leaves a lasting memory.

The Himalayan floras were surveyed during the last century. In 1882, E.T. Atkinson, in his book 'The Himalayan Districts of the North Western Provinces of India' had compiled a long list of the plants of Uttarakhand which took some 372 pages (pp. 299-671). A comparable work is not available since then. Also, the present author cannot treat the subject at Atkinson's length. Hence, a selected list of interesting species is given here which would help the readers to identify a few trees. We begin with fruit orchards.

Wild Fruits and Cultivated Fruit Orchards

The Kumaon division of Uttarakhand is famous for the cultivated varieties of fruits: Peach (ar, rek), pear (napati, nak), plum, apple (seb, se), apricot (chauru, zardalu, kushmaru), damson (bhotia-badam), walnut (akhrot), quince (bihi), medlar, orange, lemon (pahari limbu), lime (mitha limbu), citron (bijaura, karaphal), gooseberry (lepcha, galdam), strawberry (kipaliya, bhyala), mulberry (setur), mango, guava, plantain, pomegranate (anar, darim) and fig (anjir) colour the landscape. The quality of fruits varies from orchard to orchard and no systematic approach to quality control is attempted. As for the wild fruits there is no dearth of them: the forests are laden
with wild varieties of gooseberry, red and black currant (papar), blackberry, raspberry, strawberry, hazelnuts, walnuts, figs, pears, and apples, none of which are of much value. Wild rhubarb of the red species grows in large quantities in the upper ranges above 9,000 feet and is of good flavour.

Woods

The outer Himalayan forests contain varieties of trees and all do not attract the eye. However, a few of them attain magnificent proportion and do not escape notice. These are listed below.

**Sal** (Shorea robusta, Goertn., Brandis, 26, Hooker, I., 306): The tree is found in Duns and all along the foot of the hills, right from the river Jamuna to the river Sarda. It is variously known as Kandar and Sakhu, depending upon the local dialect of the people. The tree grows up to 1,000 metres—a little over 3,000 feet—on hills and attains a height of 18 to 27 metres (60 to 90 feet). Its stem is clear up to 30 to 40 feet and girth is about 6 to 8 feet. It matures in about 95 years, however, it does not achieve its full magnificence as it does along the Indo-Nepal border where the tree grows up to 150 feet with a girth of 25 feet. The tree is sacred in Buddhist folklore, as Buddha died under the shade of two giant Sal trees.

**Shisham or Sissu** (Dalbergia sisso, Roxb. Brandis, 149, Hooker, II., 231): The black wood of Shisham is known throughout India and is prized much for special woodworks. It grows throughout the submontane tracts of the Himalayas and in the Duns. It prefers moist places on the banks of streams and on the islands in the rivers. The 40 to 60 feet high tree has a girth of 6 feet. In very rare cases, a fully grown tree has a girth of 12 feet.

**Sandan or Sanan or Chandan** (Dalbergia oogeinesis, Roxb. or Ougeinia dalbergiodes, Benth; Brandis, 146; Hooker, II., 161): This tree, whose generic name is similar to Shisham, is 40 to 50 feet high and has a moderate girth of 3 to 5 feet. Some trees with 7 to 8 feet girth are found.

**Sain or Asin or Asain or Saj** (Terminalia tomentosa, W. et A.; Terminalia crenulata and coriacea, W. et A.; Pentaptera crenulata, coriacea, and tomentosa, Roxb. Brandis, 225): This is a tall tree of 80 to 100 feet height and has a girth of 8 to 10 feet. It is common all along the submontane tract of the Himalayas and is also found in the Duns.

**Har or Harara** (Terminalia chebula, Retz. Brandis, 223): This is another of Terminalias, which grows in the Siwalik ranges and all along the valleys of the interior. It ascends to an elevation of 1,500 metres (about 5,000 feet) on mountain slopes and has a height of 60 to 80 feet with a girth of 5 to 10 feet.

**Haldu** (Adina cordifilia, H. f et Benth; Nauclea cordifolia, Roxb. Brandis, 263): The trunk of Haldu is often buttressed like that of a Semal tree, otherwise it has no relation with it. It occurs abundantly in the open plain along the foot of the hills from the river Ramganga to the river Sarda. It ascends the valleys to a height of 3,000 feet. The tree is 60 to 100 feet high and has a girth of 10 to 18 feet.

**Dhauri or Bakli or Dhawa** (Anogeissus latifolia, Wall.; Conocarpus latifolia, Roxb. Brandis, 227): 'This handsome tree is common over all the submontane tract and is found in Dehra Dun, imparting a fine copper tint to the foliage of the forests in winter. It attains a height of 60-70 feet, with a girth of 6-9 feet.'
Kaim or Kangai or Phaldu (Stephegyne parvifolia, Korth.; Nauclea parvifolia, Roxb. Brandis, 262): 'This tree is gregarious, though occasionally met solitary in the open plain. It grows to a height of 50-60 feet, though specimens of 80 feet have been recorded and the average girth is 6-7 feet.'

Tun or Tuni (Cedrela toona, Roxb. Brandis, 72): The wood of this tree takes polish like that of mahogany and hence is very useful. It is common in the region west of the river Ramganga. The tree attains the height of 60 to 70 feet and has a girth of 6 to 10 feet.

Gosam or Gausam or Kosam (Schleicheria trijuga, Willd. Brandis, 105): The Duns and the Siwalik ranges are the homes of this tree, but it is also found in the valleys ascending to an elevation of 3,000 feet. The tree has practically the same height as Tun but the girth is a little less (5 to 6 feet).

Khair (Acacia catechu, Willd.; Mimosa catechu, Linn.; Mimosa sundra, Roxb. Brandis, 186): 'Katha' used in Indian 'pan' which is famous throughout the country and much relished by the people is obtained from this tree. It grows along the submontane tract and in the Duns. In the adjoining valleys it ascends to a height of 3,000 feet. The tree is of moderate height (30 to 40 feet) with a girth of 4 to 6 feet. In rare cases the girth reaches up to 8 to 10 feet.

Bamboos

This vegetation is found all over India. However, the Himalayan high altitude bamboos are different from those of plains and are called Ningal and Ringal.

Bans (Dendrocalamus strictus, Nees): It is the common bamboo found in the outer Himalayas and in the plains. It ascends up to 4,000 feet.

Ningal (Arundinaria falcata, Nees): It is the Himalayan bamboo found along the mountain streams. It occurs between 4,500 and 10,000 feet. It flowers in May and the seeds ripen in August.

Ringal (Thamnocalamus spathiflorus, Munro): It is the Himalayan high altitude bamboo which is found extensively in the Dudatoli ranges between 8,000 and 11,000 feet.

Oaks

Three varieties of oaks flourish in the Himalayas. Their names are Banj, Tilonj and Kharshu. One more variety is local to Naini Tal and a few other places in Kumaon. Its name is Rainj or Raibanj. The word 'Banj' is derived from the Sanskrit word 'Vajrakasta' which means 'iron-wood'. Vajra became bajra and banj. As the name suggests, these trees are of great strength and are valued all over the world.

Banj (Quercus incana, Roxb. Brandis, 482): Among the oaks this is a commoner tree. It adorns the outer hills of Himalayas from the river Jamuna to the river Sarda. The tree is of moderate size (height 20-30 feet and girth 4-5 feet).

Tilonj or Kilonj or Moru (Quercus dilatata, Royle; Quercus floribunda, Lind. Brandis, 482): 'This species is common on the outer ranges from the Jamuna to the Sarda at 4,500-9,000 feet. Pearson notices the noble forests of this oak in the valleys of the Bhagirathi and Jamna rivers. It attains a height of 80-90 feet and a girth of 8-9 feet. Madden records one 100 feet in height and 19', 8" in girth.'

Kharshu or Sauj (Quercus semecarpifolia, Smith, Brandis, 479): This high altitude oak grows at the elevations of 8,000 to 10,000 feet. Its height of 70 to 80 feet
is little less than that of Tilonj but its girth of 7 to 8 feet is not much different. It grows very slowly.

Rainj or Rai-banj (Quercus lanuginosa, Don.; Quercus Ianata, Wall. Brandis, 481): This is a tree local to Naini Tal (6,000 - 7,500 feet) and a few other places in Kumaon.

Besides oaks there are a few other broad-leaved trees which deserve mention.

Patangiya or Kirmali (Acer oblongum, Linn. Brandis, 110): This tree might resemble maples or sycamores (udumbar) because it comes under acer group of trees. Normally it flourishes up to 6,000 feet in the great valleys. 'Wooden drinking-cups are made from its knots.'

Papari or Box (Buxus sempervirens, Linn.; Box wallichiana, Baillon): 'This tree occurs in the upper hills at 6,000 - 8,000 feet and is common in the Bhagirathi, Jumna and Tons valleys.'

Puya-udish or utis (Betula acuminata, Wall.; The Himalayan birch tree, Brandis, 458): 'This tree occurs in sheltered places 6,500 - 10,000 feet on all the outer ranges. The alder, known as 'udish' is the Alnus nepalensis, Don., which occurs at lower elevation. Both take a fine satin polish. The people towards the snows use the bark of the silver birch (Betula bhojpatra, Wall.; Brandis, 457) for writing and packing in place of paper.'

Conifers

It is a marvel to see the Himalayan highlands covered with its conifers. The people of plains cannot imagine it. In religious discourses deodar is mentioned but most of the listeners do not know what kind of a tree it is. In gardens we find saru (casuarina) and fir which have needles as leaves and conifers belong to this group.

The flora of the world are grouped under two broad divisions - angiosperms and gymnosperms. Roughly speaking, the flowering plants come under the first group and the non-flowering plants under the second. Actually, the strict divisions are based on the study of seeds: the plants bearing the seeds which have the protective covering belong to the angiosperms and the plants bearing seeds which have no protecting covering belong to gymnosperms. The literal meaning of the Greek word gymnosperm is naked seed. This leads us to a fine distinction: evolutionally speaking, the non-flowering plants came first on this planet and the flowering plants followed. This makes the needles the primitive leaves.

Angiosperms cover most of the trees. Woods listed above come under that group. Gymnosperms have fewer trees; even then, this number is not small. For convenience these divisions are further divided into subdivisions, families, genera and so on. One of the subdivisions of gymnosperms is coniferales.

Coniferales : "Conifers are so called because their ovules, which become seeds after fertilization of the egg, are usually borne on scales aggregated into compact 'cones', woody when ripe. There are exceptions to this, such as juniper and yew, but it is true of majority of conifers."

Coniferales claim the tallest, the biggest and the oldest trees of the world. In its Pine family (Pinaceae) the Bristlecone pine of America is the oldest tree
to be found on this planet and is 4,900 years old. In its big tree family (Taxodiaceae) the red-wood tree (Sequoia sempervirens) and the big tree (Sequoia giganteum) are the American trees which are respectively the tallest and the biggest. The red-wood trees grow along the fog belt of the coastal range from south-western Oregon to central California. The tall trees often exceed 90 metres (about 300 feet). The one which is duly recorded measures 112 metres. The 'big' tree, which is the largest of all trees in bulk, and goes by the names, Mammoth tree, Giant Sequoia or Sierra Redwood, occurs in the Sierra Nevada range of California. The surviving tree, the General Sherman, of the Sequoia National Park, has a height of 83 metres (272 feet) and a diameter of more than 9 metres (30 feet). It is perhaps 3,000 years old. The Himalayan conifers are not as old; however, they belong to the same subdivision coniferales and these figures are useful to compare the sizes of Indian trees.

Three families of coniferales are found in the Himalayas—Pinaceae (Pine family), Cupressaceae (Cypress family) and Taxaceae (Yew family).

**Pinaceae:** It consists of the most widely distributed group of conifers which includes the genera Abies (Silver fir), Cedrus (Cedar), Picea (Spruce fir), Pinus (Pine) among others. The true pines belong to temperate zone and grow in very humid as well as in dry environments. The true cedars "are survivors of trees that once formed a nearly uninterrupted forest through mountains from the western Mediterranean to the western Himalayas. Today they occur only in isolated patches: forests of Deodar cedar extend from the western Himalayas to Nepal."

**Cupressaceae:** This family has several genera; however, only two of them—Cupressus (Cypress) and Juniperus (Juniper)—occur in the Himalayan mountains. The Himalayan cypress is rare, but in size is second only to deodar.

**Taxaceae:** This family is a minor one. It comprises among a couple of other genera the true yew (Taxus). Only one species (Taxus baccata) grows in the Himalayas.

There are thus a few genera of Himalayan conifers, yet, these are beautiful trees. They are small compared to the American giants but in grace deodar surpasses them all. Unfortunately, there are no National Parks for these trees and Indian naturalists have yet to honour their beautiful conifers by creating one. In the meanwhile let us examine some old records which give us a true picture of deodar or cypress.

**Atkinson's note on deodar:** "Isolated trees, such as those at Wan, often attain a great size. Dr. Stewart measured one at Kuarsi in the Ravi basin, at an elevation of 7,500 feet above the level of the sea, 44', 2" in girth at six feet (from the ground). Dr. Brandis records that one was measured at Parbani in Kunaor 34', 4" and that the girth attained by the largest trees there is 30-36'. Madden measured one between Nachar and Turanda in lower Kunaor (in 1830) having a girth of 36 ½ feet at five feet from the ground. The tallest deodar measured by him was in the Nachur forest on the Satlaj, 250 feet high, 20 feet in girth at the base, and more than 550 years old, and there was considerable number of trees in the same forest more than 200 feet high. Moorcraft measured a fallen tree in the Jugasi hill in the Dhauli valley and found it 159 feet; another was 180 feet in height."

**Madden's note on cypress:** "The famous cypress grove at Ming, four or five miles south-east of Joshamath, stands on the north-east aspects of the mountain at 7,500 feet elevation, surrounding the temple of Chandika Devi. Most of the trees are 12-16 feet round; but there is one 27 feet, measured flush with the ground on one side, 10 to 12 feet above it on the other: it branched nearly to the base.
with enormous root-bole embracing rocks and is probably not under a thousand years old."\(^{10}\)

These are some old records and do not present the recent health of these trees. I now quote the latest Indian Gazetteer:

**Gazetteer-note on deodar and cypress:** "Cedrus comprises a single species C. deodara Loud., occurring gregariously in the Western Himalayas at 1,200-3,300 m. At places it attains gigantic dimensions, and the oldest known tree exceeds 704 years in age. As ornamentals they are few trees in the world which compare with deodar. It is the strongest of Indian coniferous timbers being very resistant to white ants and fungi. Cupressus torulosa, Don. is a common associate of deodar but it does not occur in abundance." (P. Maheshwari F.R.S., J. C. Sen Gupta, C. S. Venkatesh).\(^{11}\)

The Himalayan coniferous forests principally contain three varieties of pines, one cedar, one silver fir, one spruce fir, one cypress and one yew. At 2,500 metres (7,202 feet) the tree community chiefly comprises cedar, silver fir and blue pine with some angiosperms like high altitude oaks. At still higher altitudes, alpine forests contain a few species of juniper bushes.

**Chid or Chir or the Himalayan Pine** [Pinus longifolia, Roxb., long-leaved pine, Brandis, 506; Cooke, 125; Roxb., 677 (sula in Kumaon; kalon, kolan, kolain in Garhwal; thansa above the Dun)]: The chid forests are so extensive and so many that no visitor to Uttarakhand will miss them. The tree grows on hill slopes at elevations ranging from 1,600 to 7,200 feet, however, 2,500 feet is the lowest fixed height where it flourishes fully. Chid is not known for its beauty, but its long intensely green needles are very striking. 'A fallen tree, five feet from the ground girthed 13', 6" and at 66 feet from the ground the girth was ten feet. The extreme height was 169 feet, of which 100 feet were clear of branches.' The tree is known to reach in very rare cases a height of 200 feet with a girth of 9 feet. The estimated age of such a tree is placed round 264 years. On an average, chid takes 154 years to mature when its height is about 93 feet with girth of 5', 7''.

**Dr. J. L. Stewart's analytical key for the Himalayan chid pine, Pinus longifolia, Roxb.**

Crown: Young ovate; older long ovate with broadish top

Branches of a tree in the open: Begin high, droop somewhat, then upward

Colour of the foliage: Young, light, old, dark green

Bark: Rough, gray plates, and deep irregular furrows

Leaves: 6-18" long, in 3s, stiff, erect, in persistent sheath, 6-12" long

Duration of leaves: 2 - 3 years

125
Cone: Pendulous sub-globular or ovate, young: old conical, 5-7" long, 13" girth at base, brown

Scales: With very thick knobby points, persistent

Ripe: (October) April-May

*Chilla or the Himalayan blue pine or the Bhutan pine* (Pinus wallichiana A. B. Jack; Pinus excelsa, Wallich.; Pinus peuce, Griseb.; Pinus pendula, Griff., lofty pine, Brandis, 510; Cooke, 824 (chilla and karchilla in Garhwal; dol chilla and raisalla in Kumaon)): This is a beautiful tree. It is introduced and grown in parks and gardens of the British Isles. The Oxford Book of Trees (p. 123) has a note: "Native in the Himalayas, this is a tree up to 50 meter in height, becoming broadly conical, with long drooping branches. The needles are markedly slender, flexible and drooping, and the long slightly curving cones usually have the umbo projecting tooth-like beyond the broad and grooved second-year growth. Bhutan pine is quite commonly grown in parks and gardens for its very attractive foliage."

In the Himalayas, specifically in the upper Garhwal, it occurs generally, only on spurs issuing directly from the snowy range. Its associates are cedar and firs. The elevations, at which it is found, range from 5,000 to 12,000 feet. The tree grows to a great size—13 feet girth being an average for larger trees.

Dr. J. L. Stewart's analytical key for the Himalayan blue pine, Pinus wallichiana A. B. Jack.

Crown: Conical, long ovate

Branches of a tree in the open: Begin low, sub-horizontal, ends upturned, when not fruit-laden

Colour of the foliage: Bluish or grayish green

Bark: Dark, smoothish, furrowed into irregular, small whitish plates

Leaves: 6-7" long, usually in 5s, then, drooping sheath caducous

Duration of leaves: 4 years

Cone: Pendulous, tight, conical, cylindrical, 6" long, 5-8.5" girth, resinous young bluish-green

Scales: Close imbricate, acute edged, terminal thickish umbo persistent

Ripe: October
The Himalayan Neoza Pine [Pinus Gerardiana, Wallich. Gerard's pine, (ronecha, rolecha of Kumaon)]: This tree is prized for its edible pinions. It grows locally and its distribution is as follows: 'The Gerard's pine is found between Malari and Bampa in the Dhauli valley in Garhwal, which seems to be its eastern limit, and locally in the upper valleys of the Tons and Jumna. It is generally associated with the cedar ... Its height seldom exceeds 50 feet. It rarely gives a larger girth than eight feet and is preserved for its seeds, which are collected and eaten and form a part of the 'chilghoza' of the bazaars.'

Dr. J. L. Stewart's analytical key for the Himalayan Neoza pine, Pinus Gerardiana, Wallich.

Crown: Short ovate, bushy

Branches of a tree in the open: Begin low, straightish, horizontal, curving up at ends

Colour of the foliage: Darker green than chid, and gray branches showing through

Bark: Large, long, greenish-gray plates, peeling off, darker under

Leaves: 3" long, in 3s, stiff in deciduous sheath

Duration of leaves: 2-3 years

Cone: Erect, young sub-globular, old ovate oblong, narrowed upward, 6-9" long, 14-15" girth low, bluish

Scales: Thick, spinous apex, persistent, seeds edible

Ripe: October

Deodar or the Himalayan cedar [Cedrus deodara, Loudon, Brandis, 516; Cooke, 128; Roxb., 677 (the deodar, diyar of Kumaon and Garhwal)]: This tree of immortal fame had captured the hearts of Sanskrit poets and now it has found a place in the naturalist's heart. It has made its way all over the world and is found in many gardens. The Oxford Book of Trees (p. 122) has a long note on it: 'Deodar, which is native in the Western Himalayas, is readily distinguished from other cedars by its retention of conical shape to an advanced age, its markedly drooping leading shoot and branch-tips, and its longer leaves. Young trees are narrowly conical and, although they broaden with age and may develop multiple trunks, they retain one or more pointed tops. The bark is dark grey-brown, smooth at first then cracking into vertical plates. Branches are horizontal or somewhat drooping and their tips curve downwards. Young stems are densely downy for at least two years, and the pointed buds are only 1 mm long, orange-coloured with pale-tipped scales. The leaves on short-shoots are 3-3.5 cm long, dark to bluish green and tapering to a translucent tip. The ripe female cones are 8-13 cm long, dark brown. Deodar has been much planted for its ornamental value and has reached a height of 36 m in the British Isles.'
The natural forests of deodar are fewer in Garhwal and still fewer in Kumaon. It is essentially a tree of the western Himalayas and found profusely in the states of Himachal Pradesh and Kashmir. Its occurrence in Garhwal is marginal and we have already described some of these forests. We gather a little more information from Atkinson's quote (1882): 'There are no natural groves of deodar in Kumaon and only one large forest in Garhwal... Along the western Dhauli between Kak and Malari there is a natural forest. At Lata on the Rishiganga there are healthy trees, one giving a girth of 30 feet, and at Parbani, near the Nandakini and Shatul, there are some fine groves. The average girth of the longest trees in these provinces appears to be about 15-20 feet. Major Garstuen measured some near Malari over 20 feet in girth at six feet from the ground.'

Dr. J. L. Stewart's analytical key for the Himalayan cedar, Cedrus deodara, Loudon

Crown: Pyramidal, avoid conical, or compressed columnar

Branches of a tree in the open: Begin low, straight horizontal

Colour of the foliage: Lightish green, young: very dark, old

Bark: Dark, smooth, cut into long, narrow scales, by vertical fissures

Leaves: 1" or more long, trigonous, stiff, sharp, in tufts of 30-40, on short branchlets, at last scattered

Duration of leaves: 5 years

Cone: Erect, thick cylindrical, oval or oval-oblong, obtuse, $3\frac{1}{2}$ -4" long, $7\frac{1}{2}$ -9" girth, dark brown

Scales: Close, imbricate, broad, thin, deciduous

Ripe: October

Fir and spruce are two other trees which in association with cedar and oak form extensive forests in the Himalayas. Perhaps, these two trees are very similar and there was some confusion in their terminology. In the last century, many called the silver fir Picea webbiana and Smith's spruce Abies smithiana. Today the roles of Abies and Picea are reversed: the silver fir is known as Abies and Smith's spruce as Picea. To get over this confusion, we will follow the Oxford Book of Trees, which uses the term Abies for silver fir and Picea for spruce fir.

Dodhma Ragha or the Himalayan silver fir [Abies pindrow, Royle; formerly, Abies webbiana, Lindley; Abies densa, Griffith; Picea webbiana, Loudon and Wallich.; Pius spectabilis, Lambert; Webb's fir, Brandis, 528 (ragha and rao ragha in Kumaon; bang, dodhma ragha, telia or chiti ragha and chilrao in Garhwal)]: This is one more beautiful conifer of the Himalayas. It is 120-150 feet tall and its girth ranges from 9 to 15 feet. In few cases girth exceeding 20 feet is noticed.
The tree grows in the mixed forest of cedar, spruce and birch and is found in the Bhagirathi valley above Jhala. It also occurs abundantly in the upper valleys of the rivers Jamuna and Tons, and here it is mainly associated with oaks. Brandis placed the limits at 7,500 to 13,000 feet in Garhwal and Kumaon, whereas, on Duduki-toli it is found between 7,500 and 10,000 feet. At Tungnath the limit is 11,200 feet.

We conclude our note on silver fir which perhaps has more than one species — likely number being four — with Atkinson's old records: '... occurs at Ramni on one of the spur of the Trisul, between the Pindar and Alaknanda up to the glaciers, and on the summit of Duduki-toli.'

', forms dense forests on all the great spurs towards the heads of the Pindar, Sarju, eastern Ramganga and Kali rivers: near the sources of the Kosi at Bhatkot and on the Duduki-toli range, near the sources of the western Ramganga.'

Dr. J. L. Stewart's analytical key for the Himalayan silver fir, Abies pindrow, Royle

Crown: Very narrow, cylindrical

Branches of a tree in the open: Begin low, short, declined

Colour of the foliage: Very dark

Bark: Young, smooth silvery; old grey, cut into long narrow scales by anastomosing spiral clefts

Leaves: 2" long, pointed, a silvery band on each side under, quasi-bifarious

Duration of leaves: 8-10 years

Cone: Erect, sub-globular or oval cylindrical, narrowed above, 3-4½" long, 5-9" girth, dark purple

Scales: Broad, thin, dark, deciduous

Ripe: October

Ragha or the Himalayan spruce fir [Picea smithiana, Boiss; formerly Picea morinda, Link; Abies smithiana, Forbes; Abies Khutrow, Loudon; Abies spinulosa, Griffith; Pinus smithiana, Wallich; Pinus Khutrow, Royle; Smith's spruce, Brandis, 529; Cooke, 127 (the morinda and rai of Jaunsar; kandu, re, rhai, rao, kudrau, rai ala, ragha, kail, kaluchilu and kui of Garhwal)]: This beautiful tree has found a place in the Oxford Book of Trees (p. 119). 'Native in the Himalayas, this is a broadly conical tree with dark purplish bark. It reaches 50 m or more in height and has horizontally-spreading branches and pendulous branchlets. The young stems are pale and hairless and ovoid winter-buds are up to 8 mm long, dark purple-brown, and resinous. The slender 4-sided leaves, 2-4 cm long, spread stiffly all round the
stem and point obliquely forwards. They are dark green and end in a fine horned point. The ripe female cones are 12-18 cm long. This fine and handsome tree is planted only occasionally.'

In the Himalayas, the tree is found among silver firs and has its own characteristics. It is best introduced by the way of old records.

'Smith's spruce, according to the survey, is found in the north of Garhwal near Joshimath and in the Dhauli and Vishnuganga valleys. On the left bank of the Bhagirathi above Jhala it is found with cedar, silver fir and birch on the slopes having a northern aspect. It occurs in the forests of the upper Jumna and Tons.'

'The spruce grows to an immense size. Webber mentions one on the Nandakini 18 feet in girth and 110 feet in height. Hodgson records the length of a fallen tree as 169 feet — and Madden gives the girth of ten trees as varying from 13 ½ to 20 feet and showing an average girth of 16 feet. Dr. Stewart, has recorded one of 21 feet, but the average girth is 8-12 feet with a height of 100-150 feet. As has been noticed, the spruce prefers a northern aspect, and this is but one of many instances of the phenomenon which strikes every traveller in the Himalaya, that of the northern and north-western aspects being densely wooded, whilst the south and south-eastern are wholly or almost bare.'

Dr. J. L. Stewart's analytical key for the Himalayan spruce fir, Picea smithiana, Boiss

Crown : Tall, narrow cylindrical

Branches of a tree in the open : Begin low, horizontal, or downward, with tassel-like twigs

Colour of the foliage : Like that of blue pine, but with a rather darker tinge

Bark : Very smooth, cut into small quadrangular plates by shallow furrows

Leaves : 1½" long, compressed tetragonal, stiff, sharp, solitary. Scattered all round branches

Duration of Leaves : 8-10 years

Cone : Pendulous from tips, oblong cylindrical, sub-narrowed upward 3-4½" long, 4 ½ - 5½" girth, brown or purplish

Scales : Thin, membranous edged, persistent

Ripe : October
Tungsing or the Hemlock spruce of Nepal [... Abies dumosa, Loudon; Pinus dumosa, Don. Pinus brunoniana, Wallich.; Brandis, 527 (the tungsing of the Bhotiyas of Darma in Kumaon; changathau dhup of Nepal]): As the name suggests, this is a Nepalese tree, and is found on the Indo-Nepal border. To be specific, 'in Kumaon, it occurs in Darma and about the Chipula range at 9,000-11,000 feet, and here it is called 'tungsing' and attains a height of 80-100 feet, with an average girth of 10-12 feet.'

Surai or the Himalayan cypress [Cupressus torulosa, Don.; Brandis, 533 (surai, surai in Kumaon and Garhwal; rai sulla in Naini Tal)]: This is a lofty tree and many times mistaken for deodar. In size both are almost equal but in distribution the former is not as abundant. A century ago it was "Found in Chaudans, Naini Tal, and of remarkable size near Ramni and Wan on the Kailganga in Garhwal, and from Joshimath to Niti. ... It occurs along the Kalimudi range, separating the Ramganga from the Gori. 'The older trees in a favourable climate grow up in a slender column like the silver fir,' and, except that the foliage is a yellowish green, considerably resemble it in its sombre colour and columnar appearance. The thick contorted boughs also give it a rough appearance. At Naini Tal the boughs with a southern aspect are fuller and more regular, giving the tree a lop-sided appearance."

"The cypress occurs also in the Bhagirathi valley and along the head-waters of the Jumna and the Tons. In Munysapit it occurs at 7,000-9,000 feet; in Naini Tal at 6,500-8,000 feet and in the valley of the western Dhauli it abounds from 7,000-8,000 feet: 'after leaving the oaks, elms, hornbeams, etc., the wood becomes entirely cypress, and from summit to base of the mountains no other tree is seen. The larger trees not unfrequently attain an enormous size, some of them having a girth of 27 feet.' Major Garstin measured one at Wan over 38 feet and several were over 20 feet."

This was once the health of cypress forests in the Himalayas. Do such forests exist today?

In passing, we may note that there is another variety of cypress which is called Cupressus sempervirens, Linn., and is 'occasionally cultivated in gardens of Kumaon at low elevations.'

Dr. J. L. Stewart's analytical key for the Himalayan cypress, Cupressus torulosa, Don.

Crown: Long conical, like garden cypress

Branches of a tree in the open: Begin lowish, of young horizontal, sub-declining; of old horizontal, with drooping sub-divided tips

Colour of the foliage: Young bluish green; old, darker (but browner) than the silver fir

Bark: Brown, smooth, sulcate, fibrous, peeling off in long strips, often sub-twisted
Leaves: Scale-like, quadrifariously close imbricate

Duration of leaves: ?

Cone: Globular or sub-oval, 6" long, 1½" girth, fuscous, bluish, glaucaceous

Scales: Each scale with 4-6 facets

Ripe: October-November

Thaner or the Himalayan yew [Taxus baccata, Linn.; Taxus nucifera, Wall., Taxus wallichiana, Zucc., Brandis, 537 (thaner in Kumaon)]: After giant trees, this is a small conifer. 'The yew is' found at Bala Jagesar, 5,900 feet; Puya pani, on the road to Deo Dura, 6,500 feet; on Thakil in Sor; Kanol on the Nandakini; Chula on Chaudas; Laduli ghat on the Nayar (7,000 feet) and near Tungnath, but is indigenous only on the spur from the snowy range. It occurs with box and cypress in the Bhagirathi valley between Bhatwari and Jhala and along the head-waters of the Tons and Jumna.

'In Garhwal, poor scrubby specimens ascend as high as 11,200 feet on Kedarnath and to 11,000 feet on Tungnath. Hoffmeister records a tree near Gangotri, 15 feet in girth, ..., but the average girth is not more than 5-8 feet and height 20-30 feet.'

Dr. J. L. Stewart's analytical key for the Himalayan yew, Taxus baccata, Linn.

Crown: Broad oval, irregular

Branches of a tree in the open: Trunk short or none, branches lax, irregular

Colour of the foliage: Darkish green

Bark: Young, silvery, old smooth, brown, fibrous, compact, not sulcate, peeling off in layers

Leaves: Flat, falcate, entire, sharp mucronate, alternate distichous

Cone: Sub-drupe, 4-5 ½" long, 1½ - 1½" girth, cup red, fleshy, nucule greenish olive.

Scales: ...

Ripe: September to January

Juniper: This remaining conifer, which belongs to the cypress family, could not be classed along with the above trees because a juniper can be a tree or a bush or even a creeper. Its twigs are used in Indian homes and temples as 'dhup'.

Juniper, if a tree, does not attain any great height. It seldom exceeds 30 feet. On an average it remains below 15 feet, however, its trunk is thick - girth '2-5 feet at six feet from the ground and often 6-8 feet and in some cases much more.' Brandis' note records one small tree in Lahul which attained a girth of 33½ feet.
'The juniper is often confounded with the cypress; the former, though the ultimate ramifications are very numerous, has them much shorter and pendulous than the cypress, and the green is more brilliant. The leaves are closely imbricated in decussate pairs, somewhat obtuse, with a central gland or raised line on the back; four-ranked and imbricate, or slender, acute, disposed in threes and spreading. The fruit ripens in September-October, of a purplish blue colour, the size of a small pea, one or two-seeded, with a strong aroma when bruised.'

**Padma or the Himalayan ground cypress** [Juniperus communis, Linn.; varieties alpina, nana; Brandis, 535 (padma and parpinja of Niti; churpunja of the Mana valley; ... ; the chichiya of Milam ...)]: 'It is found ... at Milam and Tola (11,000-12,000 feet), Bampa, Malari (10,500 feet), Jelam (9,000 feet), and Rimkim (14,000 feet) on the glacier-moraines of the Vishnuganga. It is said to be used as one of the sources of incense and rarely attains a height more than 7-8 feet with a stem 18-24 inches.'

**Gugal or the Himalayan weeping blue juniper** [Juniperus recurva, Ham. Brandis, 536 (the better, bhedara, jhora, gugal, aru and agaru of Kumaon and Garhwal; the bil of Milam)]: 'There are two varieties: one with acute spreading leaves, found at 12,000 to 13,000 feet; the other with imbricated cupressiform leaves and extending to nearly 15,000 feet. It flowers in May-August and the fruit ripens during July-November.

'It occurs beyond Milam and Niti (to 15,000 feet); in the valleys of the Dhauli (lower limit 9,000 feet), Vishnuganga and Kedarganga, at Pindari and most other glaciers. Hodgson found it on the Bhagirathi at 12,914 feet, and describes it as having there in the form of a large creeper, not a tree, some of the branches were 6 inches in diameter and of considerable length; in some places they were above the spongy soil and in others below the surface.'

**Padmak or the Himalayan pencil cedar** [Juniperus excelsa, M. Bieb. Brandis, 538 (padmak of Milam)]: 'This is another of the sources of Tibetan incense. It occurs at the upper limits of the silver fir (8,900-11,500 feet) beyond Milam; at Jelam on the Dhauli (9,000 feet) and in the valley of the Girthi.'

'The pencil cedar occurs also in the valley of the Jadh-ganga at over 11,000 feet and was first found there by Captain Herbert.'

**Flowers**

The Himalayan flowers grow in such varieties and abundance that they cannot escape the notice of any visitor. They mostly blossom during monsoon. The ideal places where they are found are the Himalayan alpine meadows locally called 'bugials'. These are the nature's gardens; the one which has become very famous is the Bhyunder Valley. It is also called by its discoverer, Frank Smythe, the Valley of Flowers. The apt way to introduce these flowers is through Smythe's description of the Valley of Flowers in his book 'Kamet Conquered'.

**The Valley of Flowers:** "We saw that we had entered the Kingdom of Flowers. Barrenness was replaced by beauty. Our misery was forgotten as we gazed upon little clusters of light blue primulas, watered by melting snows ..."
"... Lower down we entered what I can only describe as an Eden of flowers. Growing among the rocks was the tiny stemless _Primula reptans_; the flowers of the commoner but beautiful _Primula denticulata_ covered the hillside, and above the glacier were three varieties of androsaces. Between clumps of creamy dwarf rhododendrons, the ground was purple with dwarf irises, and blue and yellow with pansies and fritillaries. As the track descended we came upon the most beautiful of all Himalayan flowers, the meconopsis (blue poppy). Its petals are as blue as a glacier lake, and its stamens as golden as the sunset glow on the great peaks beneath which it grows...

"... As we descended, the flora became more and more luscious until we were wading knee deep through an ocean of flowers, ranging in colour from the sky blue of the poppies to the deep wine red of the potentillas...

"... To us the Bhyundar Valley will always remain the Valley of Flowers. It is a place of escape for those wearied of modern civilization...

"... but for half a year the lover of beauty and solitude could find peace in the Valley of Flowers. He would discover joy and laughter in the meadows; the stars would be his night canopy; he would watch the slow passing of the clouds; he would share the sunset and the dawn with Gods."

Smythe's team-mate, Holdsworth — botanist of the expedition — who identified most of these flowers has left his own impression: "All of a sudden I realised that I was simply surrounded by primulas ... And what a primula it was! Its look-like habit proclaimed it a member of the nivalis section. All over the little shelves and terraces it grew, often with its roots in running water. At the most it stood six inches high, but its flowers were enormous for its stature, and ample in number — sometimes as many as thirty to the beautifully proportioned umbel, and in colour for the most heavenly French blue, sweetly scented."

These narrations leave an indelible impression that the Himalayan flowers are of rare beauty and their colours vie with the glories of Himalayan skies at sunrise and sunset. Further, in the nature's scheme of things flowers are not fewer but are so plentiful that the ground is literally submerged with them. The air becomes fragrant and land puts on the garb of myriad colours making it a Fairyland. "... The Bhyundar Valley was the most beautiful valley that any of us had seen ... we remembered it afterwards as the Valley of Flowers."

Smythe, in his book 'The Valley of Flowers', devoted eleven pages to list these flowers. With Holdsworth's note in Kamet Conquered, the books give a fairly good account of the Himalayan flowers. The present author does not wish to duplicate their works. Instead, he selects a few representative flowers.

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**The Blue Poppy**

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By common consensus, this is the most beautiful flower of the Himalayas. 'In all my mountain wanderings I had not seen a more beautiful flower than this primula; the fine raindrops clung to its soft petals like galaxies of seed pearls and frosted its leaves with silver.' (Smythe)
Words can scarcely convey the beauty of flowers. One has to see them and smell them. To see the blue poppy one has to go to the Himalayas. One may derive some consolation by seeing it in some books. (See bibliography under Smythe or Verghese).

Edelweise

Compositae

Leontopodium himalayanum DC

This is one more flower which has found favour with the lovers of the Himalayan flowers. In the Swiss alps the flower is mostly white and is much admired by the mountaineers. Its counterpart in the Himalayas too found a ready acceptance.

Large rock anemone

Ranunculaceae

Paraquelegia grandiflora

Anemone in Greek means the daughter of wind. In seas a colourful creature with flowerlike head is also called sea anemone. It is a common flower in Britain and is known as wind-flower. This explains the visitor's liking for the Himalayan anemone.

Fritillary

Liliaceae

Fritillaria oxypetala

Many writers of Himalayan books have referred to this beautiful flower. It is lily-like and has perhaps a yellow colour which is so pleasing that the beholder cannot take away his eyes from it. It is often visited by butterflies and they too carry the same name — Fritillary.

Rhododendron

Ericaceae (the heather family)

Rhododendron arboreum and
Rhododendron barbatum, Wall.

This is the most famous flowering tree of the Himalayas and its blood-red flowers are seen along the roadside. The author saw them on a mountain pass between Dras and Dandiyagaon. The tree is described in the Oxford Book of Trees (p. 142): 'Rhododendron arboreum, the first Himalayan species to be introduced, can be a tree up to 12 meters (40 feet) high. Its leaves are up to 20 cm long, with white or rusty hairs beneath, and its cup-shaped white to blood-red flowers are borne in dense spherical clusters from January to April and are often spoilt by frost.'
Rhododendron barbatum, Wall. might be the high altitude dwarf variety which has white flowers and is mentioned by mountaineers so often.

I am a wild flower
Of a wayside ravine
Can't compare or compete

Garden's exotic ones
Tended by skilled hands
With all care and love
Adorn the landscape

I am born — unseen, unsung
To be trampled underfoot
By a wayward wild animal

REFERENCES

2. I could not retrace this quote.
   All quotes on conifers are within these 20 pages. I have not tried to relocate the exact page number because this old book crumbles on handling.
4. Ibid., p. 826
5. Ibid., p. 834
10. Ibid., pp. 838 - 842
12. F. S. Smythe, op cit, p. 222
14. Oleg Polunin and Adam Stainton, Flowers of the Himalaya, Oxford University Press, Delhi, 1984, see 1306, 1308, 1311, 1314, 1315, 1316, 1318, pp. 510 - 511
3. FAUNA

The Himalayan fauna is as rich and varied as its flora. In consonance with its mountainous topography and surrounding vegetation, it complements the overall dynamism of the Himalayan setting. The animals are simply beautiful and are full of charm. They impart life to the magnificent Himalayan scenery. Forests are incomplete without them. The enormous diversity of these flora and fauna is really bewildering. It is based not only on the complexity of mountainous terrain but also on altitude, latitude and climate which ultimately decide the shifts in life-zones from tropic to arctic — a fantasy telescoped within a height of five miles and definitely not seen elsewhere.

"Wild life? That is how we refer to the magnificent animals of our jungles and to the beautiful birds that brighten our lives. I wonder sometimes what these animals and birds think of man and how they would describe him if they had the capacity to do so. I rather doubt if their description would be very complimentary to man. In spite of our culture and civilisation, in many ways man continues to be not only wild but more dangerous than any of the so-called wild animals.

"Nature is said to be red in tooth and claw, and life is precarious in the forest. The strong prey on the weak and the weak develop subterfuges and camouflages to protect themselves. But this eternal way of the forest is due principally to the quest for food. Man does not eat man, but he kills him for other purposes; and even where he does not kill the body, he kills the spirit. We are strange mixtures of good and evil, of civilisation and barbarism, of the divine and the base. We talk in one language and act in another way. We hold aloft noble ideals and shout many slogans, but in our behaviour we belie them. We talk of peace and our manner of doing so is often aggressive and warlike.

"In India, perhaps even more than in other countries, there is this difference between precept and practice. In no country is life valued in theory so much as in India, and many people would even hesitate to destroy the meanest or the most harmful of animals. But in practice we ignore the animal world. We grow excited about the protection of the cow. The cow is one of the treasures of India and should be protected. But we imagine that we have done our duty by passing some legislation. This results not in the protection of the cow but in much harm to it as well as to human beings. Cattle are let loose and become wild and become a danger not only to crops but to human beings. They deteriorate and the very purpose for which we value the cow is defeated.

"In many other countries, even children take great interest in animals and birds. There are innumerable books on the animal world, and many people take arduous journeys to see some rare bird. Societies of Bird Watchers are formed, not to kill them but to see and study them. How many of our people know even the names of the less common birds? How few books we have about birds and animals?
"I welcome this new interest in India in the preservation of wild life. I cannot say we should preserve that form of wild life which is a danger in our civilized haunts or which destroys our crops. But life would become very dull and colourless if we did not have these magnificent animals and birds to look at and to play with. We should, therefore, encourage as many sanctuaries as possible for the preservation of what yet remains of our wild life. Our forests are essential for us from many points of view. Let us preserve them. As it is, we have destroyed them far too much. It is true that as population grows the need for greater food production becomes necessary. But this should be by more intensive cultivation and not by the destruction of the forests which play a vital part in the nation's economy.

"... I agree ... that it is much more exciting and difficult to 'shoot' with a camera than with a gun and wish that more and more adventurous young men would give up the gun in favour of the camera. We must try to preserve whatever is left of our forests and the wild life that inhabits them."

Today, in many parts of the Himalayas, forests are few and far between and the wildlife is sparse. It is easy to admire a tree or a flower because we can stand before it and gaze at it for hours. We may even become vociferous and praise it; but we cannot see wildlife like that. Birds fly from tree to tree and to see them we have to remain quiet and still until they fly past us or sit on a rock or a tree. This taxes our patience. The wild animals are still difficult to come across because they fear man as we fear them. It requires extraordinary courage and nerves of steel to watch a tiger or a leopard at close quarters. Few would wish to meet them in open. This is the fact of life. Thus, we look for a man who had the qualities we lack. Such was Jim Corbett. The forests of Kumaon and Garhwal were his home. He lived there for more than a quarter of a century and knew every nook and corner. He wrote immortal books about the country and the animals he loved. He did not catalogue them but portrayed the interplay of life from which emerged the dynamic picture of these forests.

We begin with Corbett's description of a tiger and a leopard who were virtually his close friends:

"A man-eating tiger is a tiger that has been compelled, through stress of circumstances beyond its control, to adopt a diet alien to it. The stress of circumstances is, in nine cases out of ten, wounds, and in the tenth case old age. The wound that has caused a particular tiger to take to man-eating might be the result of a carelessly fired shot and failure to follow up and recover the wounded animal, or be the result of the tiger having lost his temper when killing a porcupine. Human beings are not the natural prey of tigers, and it is only when tigers have been incapacitated through wounds or old age that, in order to live, they are compelled to take to a diet of human flesh.

"A tiger when killing its natural prey, which it does either by stalking or lying in wait for it, depends for the success of its attack on its speed and, to a lesser extent, on the condition of its teeth and claws. When, therefore, a tiger is suffering from one or more painful wounds, or when its teeth are missing or defective and its claws worn down, and it is unable to catch the animals it has been accustomed to eating, it is driven by necessity to killing human beings. The change-over from animal to human flesh is, I believe, in most cases accidental..."
"A tiger on a fresh kill, or a wounded tiger, or a tigress with small cubs occasionally kills human beings who disturb them; but these tigers cannot, by any stretch of imagination, be called man-eaters, though they are often so called. ..."

"Another popular belief in connection with man-eaters is that the cubs of these animals automatically become man-eaters. This is quite a reasonable supposition; but it is not borne out by actual facts and the reason why the cubs of a man-eater do not themselves become man-eaters is that human beings are not the natural prey of tigers, or of leopards.

"A cub will eat whatever its mother provides, and I have even known of tiger cubs assisting their mothers to kill human beings; but I do not know of a single instance of a cub, after it had left the protection of its parent, or after that parent had been killed, taking to killing human beings.

"In the case of human beings killed by carnivora, the doubt is often expressed as to whether the animal responsible for the kill is a tiger or leopard. As a general rule — to which I have seen no exceptions — tigers are responsible for all kills that take place in daylight, and leopards are responsible for all kills that take place in the dark. Both animals are semi-nocturnal forest-dwellers, have much the same habits, employ similar methods of killing, and both are capable of carrying their human victims for long distances. It would be natural, therefore, to expect them to hunt at the same hours; and that they do not do so is due to the difference in courage of the two animals. When a tiger becomes a man-eater it loses all fear of human beings and, as human beings move about more freely in the day than they do at night, it is able to secure its victims during daylight hours and there is no necessity for it to visit their habitations at night. A leopard on the other hand, even after it has killed scores of human beings, never loses its fear of man; and, as it is unwilling to face up to human beings in daylight, it secures its victims when they are moving about at night, or by breaking into their houses at night. Owing to these characteristics of the two animals, namely, that one loses its fear of human beings and kills in the daylight, while the other retains its fear and kills in the dark, man-eating tigers are easier to shoot than man-eating leopards.

"When I see the expression 'as cruel as a tiger' and 'as bloodthirsty as a tiger' in print, I think of a small boy ... wandering through the jungles of the terai and bhabar in the days when there were ten tigers to every one that now survives; sleeping anywhere he happened to be when night came on, with a small fire to give him company and warmth, wakened at intervals by the calling of tigers, sometimes in the distance, at other times near at hand; throwing another stick on the fire and turning over and continuing his interrupted sleep without one thought of unease; knowing from his own short experience and from what others, who like himself had spent their days in the jungles, had told him, that a tiger, unless molested, would do him no harm; or during daylight hours avoiding any tiger he saw, and when that was not possible, standing perfectly still until it had passed and gone, before continuing on his way. And I think of him on one occasion ... on creeping up to a plum bush and standing up to peer over, the bush heaving and a tiger walking out on the far side and, on clearing the bush, turning round and looking at the boy with an expression on its face which said clearly as any words, 'Hello,
kid, what the hell are you doing here?' and, receiving no answer, turning round and walking away very slowly without once looking back. And then again I think of the tens of thousands of men, women, and children who, while working in the forests or cutting grass or collecting dry sticks, pass day after day close to where tigers are lying up and who, when they return safely to their homes, do not even know that they have been under the observation of this so-called 'cruel' and 'bloodthirsty' animal.

"Half a century has rolled by since the day the tiger walked out of the plum bush, the latter thirty-two years of which have been spent in the more or less regular pursuit of man-eaters, and though sights have been seen which would have caused a stone to weep, I have not seen a case where a tiger has been deliberately cruel or where it has been bloodthirsty to the extent that it has killed, without provocation, more than it has needed to satisfy its hunger or the hunger of its cubs.

"A tiger's function in the scheme of things is to help maintain the balance in nature and if, on rare occasion when driven by dire necessity, he kills a human being, or when his natural food has been ruthlessly exterminated by man he kills two percent of the cattle he is alleged to have killed, it is not fair that for these acts a whole species should be branded as being cruel and bloodthirsty.

"Sportsmen are admittedly conservative, ..., and ... I do not flatter myself that all the opinions I have expressed will meet with universal agreement.

"..., however, one point on which I am convinced that all sportsmen — ... — will agree with me, and that is, that a tiger is a large-hearted gentleman with boundless courage and that when he is exterminated — as exterminated he will be unless public opinion rallies to his support — India will be the poorer by having lost the finest of her fauna.

"Leopards, unlike tigers, are to a certain extent scavengers and become man-eaters by acquiring a taste for human flesh when unrestricted slaughter of game has deprived them of their natural food.

"The dwellers in our hills are predominantly Hindu, and as such cremate their dead. ... In normal times these rites are carried out very effectively; but when disease in epidemic form sweeps through the hills and the inhabitants die faster than they can be disposed of, a very simple rite, which consists of placing a live coal in the mouth of the deceased, is performed in the village and the body is then carried to the edge of the hill and cast into the valley below.

"A leopard, in an area in which his natural food is scarce, finding these bodies very soon acquires a taste for human flesh, and when the disease dies down and normal conditions are established, he very naturally, on finding his food supply cut off, takes to killing human beings."2

These are the most appropriate and magnificent tributes to our finest of fauna from the one who had to hunt them for their own good and for the good of mankind. He did this at a grave risk to his own life:
"The Champawat man-eater had made over four hundred kills. I was tracking her closely when suddenly the tigress broke cover. My .500 modified cordite rifle shot high. I'd hit her — but a little far back. Lowering her head, she turned toward me. I shot again. She flinched but stood her ground. Ears flat, teeth bared, she was ready to charge: I froze — I realized I had no more cartridges. My rifle was empty..." 

At times, in his hazardous occupation he was rewarded with happy moments:

"Nowhere along the foothills of the Himalayas is there a more beautiful setting for a camp than under the Flame of the Forest trees at Bindukhera, when they are in full bloom. If you can picture white tents under a canopy of orange-coloured bloom; a multitude of brilliantly plumaged red and gold minivets, golden orioles, rose-headed parakeets, golden-backed woodpeckers, and wire-crested drongos flitting from tree to tree and shaking down the bloom until the ground round the tents resembled a rich orange-coloured carpet; densely wooded foothills in the background topped by ridge upon rising ridge of the Himalayas, and they in turn topped by the eternal snows, then, and only then, will you have some idea of our camp at Bindukhera one February morning in the year 1929." 

Now we read how a tiger in an unfortunate encounter with a porcupine became a man-eater:

"Eighteen miles to the north-north-east of Naini Tal is a hill 8,000 feet high and twelve to fifteen miles long, running east and west. The western end of the hill rises steeply and near this end is the Muktesar Veterinary Research Institute. ... The laboratory and staff quarters are situated on the northern face of the hill and command one of the best views to be had anywhere of the Himalayan snowy range. This range, and all the hills that lie between it and the plains of India, run east and west, and from a commanding point on any of the hills an uninterrupted view can be obtained not only of the snows to the north but also of the hills and valleys to the east and to the west as far as the eye can see. People who have lived at Muktesar claim that it is the most beautiful spot in Kumaon, and that its climate has no equal.

"A tigress that thought as highly of the amenities of Muktesar as human beings did, took up her residence in the extensive forests adjoining the small settlement. Here she lived very happily on sambhar, kakar, and wild pig, until she had the misfortune to have an encounter with a porcupine. In this encounter she lost an eye and got some fifty quills, varying in length from one to nine inches, embedded in the arm and under the pad of her right foreleg. Several of these quills after striking a bone had doubled back in the form of a U, the point and the broken-off end being close together. Suppurating sores formed where she endeavoured to extract the quills with her teeth, and while she was lying up in a thick patch of grass, starving and licking her wounds, a woman selected this particular patch of grass to cut as fodder for her cattle. At first the tigress took no notice, but when the woman had cut the grass right up to where she was lying, the tigress struck once, the blow crushing in the woman's skull. Death was instantaneous, for, when found the following day, she was grasping her sickle with one hand and holding a tuft of grass, which she was about to cut when struck, with the other.
Leaving the woman lying where she had fallen, the tigress limped off for a distance of over a mile and took refuge in a little hollow under a fallen tree. Two days later a man came to chip firewood off this fallen tree, and the tigress who was lying on the far side killed him also. The man fell across the tree, and as he had removed his coat and shirt and the tigress had clawed his back when killing him, it is possible that the sight of blood trickling down his body as he hung across the bole of the tree first gave her the idea that he was something that she could satisfy her hunger with. However that may be, before leaving him she ate a small portion from his back. A day later she killed her third victim deliberately, and without having received any provocation. Thereafter she became an established man-eater.  

Finally, we read an account of a fight between two wild animals which by itself is a rare event in nature. Corbett could not see it but heard it from his hidden perch in a tree:

"A place had now to be found in which to sit. There were several big oak trees on either side of the ravine, but none overlooked the kill and all of them were unclimbable. Thirty yards below the kill and on the left-hand side of the ravine was a small stout holly tree. The branches were growing out at right angles to the trunk, and six feet above ground there was a strong enough branch for me to sit on and another on which to rest my feet. The three men protested strongly against my sitting so close to the ground. ...

'... I settled down on the holly branch for what I anticipated would be a long wait, for the hill faced west and the tiger would probably not be on the move much before sundown. To the left, my field of vision — through the holly leaves — extended down the ravine for fifty yards. In front I had a clear view into the ravine, which was about ten feet deep and twenty feet wide, and of the hill facing me on which there were outcrops of rock but no trees. To the right I had a clear view up to the ridge but I could not see the kill, which was hidden by the thick growth of saplings. Behind me was a dense thicket of ringals which extended down to the level of my tree and further helped to mask the kill. ...

"There were sambhar, kakar, and langur in the jungle and a great number of pheasants, magpies, babblers, thrushes, and jays, all of which call on seeing a member of the cat family, so I thought I would receive ample warning of the tiger's coming. But here I was wrong, for without having heard a single alarm call, I suddenly heard the tiger at his kill. After going down the ravine, possibly for a drink, the tiger had skirted round the thicket of ringals and approached his kill without passing me. This did not worry me unduly for tigers are restless at a kill in daylight, and I felt sure that sooner or later the tiger would show up on the open ground in front of me. He had been eating for about fifteen minutes, tearing off great chunks of flesh, when I caught sight of a bear coming along the crest of the hill from left to right. He was a great big Himalayan black bear, and was strolling along as though it did not matter to him how long he took to get from here to there. Suddenly, he stopped, turned facing down hill, and lay flat. After a minute or two he raised his head, sniffed the wind, and again lay flat. The wind, as always in daylight in the hills, was blowing uphill and the bear had got the scent of flesh and blood, mingled with the scent of tiger. I was a little to the right of the kill, so he had not got my scent. Presently he got to his feet and, with bent legs and body held close to the ground, started to stalk the tiger."
"It was a revelation to me in animal stalking to see that bear coming down the hill. He had possibly two hundred yards to go and though he was not built for stalking, as tigers and leopards are, he covered the distance as smoothly as a snake and silently as a shadow. The nearer he got the more cautious he became. I could see the lip of the fifteen-foot drop into the hole, and when the bear got to within a few feet of this spot he drew himself along with belly to ground. Waiting until the tiger was eating with great gusto the bear very slowly projected his head over the lip of the hole and looked down, and then as slowly drew his head back. Excitement with me had now reached the stage when the whole of my body was trembling, and my mouth and throat were dry.

"On two occasions I have seen Himalayan bears walk off with tigers' kills. On both occasions the tigers were not present. And on two occasions I have seen bears walk up to feeding leopards and, after shooing them off, carry the kills away. But on this occasion the tiger — and a big male at that — was present on his kill and, further, he was not an animal to be shooed away like a leopard. At the back of my mind was the thought that surely this bear would not be so foolish as to try to dispossess the king of the jungle of his kill. But that was just what the bear appeared to intend doing, and his opportunity came when the tiger was cracking a bone. Whether the bear had been waiting for this moment I do not know; anyway, while the tiger was crunching the bone, the bear drew himself to the edge and, gathering his feet under him, launched himself into the hole with a mighty scream. The object of the scream I imagine was to intimidate the tiger, but so far from having this effect it appeared to infuriate him, for the bear's mighty scream was answered by an even mightier roar from the tiger.

"Fights in the wild are very rare and this is only the second case I know of different species of animals fighting for the sake of fighting and not for the purpose of one using the other as food. I did not see the fight, for the reasons I have given, but I heard every detail of it. Waged in a hollow of restricted area the sound was terrifying and I was thankful that the fight was a straight one between two contestants who were capable of defending themselves, and not a three-cornered one in which I was involved. Time stands still when every drop of blood racing through a rapidly beating heart is tingling with excitement. The fight may have lasted three minutes, or it may have lasted longer. Anyway, when the tiger considered he had administered sufficient chastisement he broke off the engagement and came along the open ground in front of me at a fast gallop, closely followed by the still screaming bear. Just as I was aligning the sights of my rifle on the tiger's left shoulder he turned sharp to the left and, leaping the twenty-foot-wide ravine, landed at my feet. While he was still in the air I depressed the muzzle of the rifle and fired, as I thought, straight into his back. My shot was greeted with an angry grunt as the tiger crashed into the ringals behind me. For a few yards he carried on and then there was silence; shot through the heart and died in his tracks, I thought.

"A .500 modified cordite rifle fired anywhere makes a considerable noise, but here, in the ravine, it sounded like a cannon. The detonation, however, had not the least effect on the maddened bear. Following close on the heels of the tiger he did not attempt to leap the ravine, as the tiger had done.
Storming down one bank he came up the other straight towards me. I had no wish to shoot an animal that had the courage to drive a tiger off his kill, but to have let that screaming fury come any nearer would have been madness, so, when he was a few feet from me, I put the bullet of the left barrel into his broad forehead. Slowly he slid down the bank on his stomach, until his haunches met the opposite bank.

"Where a moment earlier the jungle had resounded with angry strife and the detonations of a heavy rifle, there was now silence. ... At that moment I caught sight of a movement on my right and, turning my head, saw the tiger unhurriedly cantering along on the open ground over which he had galloped a minute or two earlier and looking, not at me, but at his dead enemy.

"Surprise at seeing the tiger alive and unhurt lost me a second or two, and thereafter I acted quickly. ... with only one barrel loaded, I put up the rifle and fired. At my shot he reared up, fell over sideways, made a bad landing, scrambled to his feet, and cantered on round the shoulder of the hill with his tail in the air. The ... bullet ... had struck the rock ... and the blow-back had thrown him off his balance but had done him no harm.

" ... I stepped down from the holly tree and went to have a look at the bear, who, I found, was even bigger than I had at first thought. His self-sought fight with the tiger had been a very real one, for blood from a number of deep cuts was seeping through the thick fur on his neck and in several places his scalp was torn right down to the bone. These wounds in themselves would have mattered little to a tough animal like a bear, but what did matter and what had annoyed him was the injury to his nose. All males resent being struck on the nose, and not only had the bear been struck on that tender spot but insult had been added to injury by his nose being torn in half. Reason enough for him to have chased the tiger with murder in his eyes, and for him to have ignored the report of my heavy rifle."16

Jim Corbett was a legendary figure in Kumaon and Garhwal. Today, his memory is kept alive by naming one sanctuary there as the Corbett National Park.

Jim Corbett National Park

This is one of the important and major sanctuaries of India. Perhaps, it is the oldest and Corbett was associated with it when it was known as the Hailey Park. It dates back to 1935 and its present condition (1977) is best described by M. Krishnan: "The sub-Himalayan stretch of Uttar Pradesh has many sanctuaries. The best known is the Corbett National Park. The park covering 325 sq km has a magnificent setting of Himalayan foothills with the river Ramganga, flanked with forests typical of northern Indian riverin tracts, flowing through. At Dhikala, where the lodges are, there is a lofty sal forest and beyond it lie miles and miles of open country covered with herbage with the trees few and far between. The roads are motorable and riding elephants available. The park was formerly famous for its tigers, still to be seen. There are some elephants but the main faunal feature is the many herds of chital which attain a fine size of body and antlers. There are also hog deer here, and this is one of the few places, where chital and their less attractive cousin, the hog deer, are to be found on the same ground. Pig, occasional bear or leopard and muntjac are the other chief mammals. In the Ramganga there are large river tortoises. The bird life is rich. Corbett Park has now been made a tiger reserve under Project Tiger."17
The animal kingdom is divided into classes, orders, families, genera and species. For example, a dog is classed as a mammal whereas a snake is classed as a reptile. Dogs and cats belong to the order carnivora, although their families are different. Cats are called feline animals because their family is Felidae and so on. We will follow this nomenclature. For the description of mammals I have relied only on one source, that of Prater, which happens to be an excellent treatise on the subject. I have quoted extensively from this without using quotation marks. However, whenever I have used the quotation marks, it is to separate his text from mine.

Mammals

We begin with apes, monkeys and lemurs because they are cousins of man and are grouped together in a common Natural Order the Primates, the first, the highest of animals. This ascendancy of the primate is due to man's egocentricism and is purely mental because there is nothing to show that its bodily structure is of superior make. The other creatures which are thought of being lowly may often be much better fitted for their special ways of life.

In India, we do not have the apes like gorilla, chimpanzee or orang-utan, but we have a single species of gibbon, which is known as the Whitebrowed Gibbon or Hoolock which resides in Assam. We have two species of lemurs — the Slow Loris and the Slender Loris — which do not resemble man at all. The former lives in Assam and the latter is common in South India. In the Himalayas, we have monkeys and langurs — the former are sturdy, squat and solid, whereas the latter are tall, slim and stately.

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**THE Rhesus Macaque or MONKEY**

Prater, p. 36, Plate 10 facing p. 48

Local Names: Hindi - bandar; Bengali - markat; Kashmiri - punj, ponj.

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<td>Macaca mulatta (Zimmermann)</td>
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**Size**: Seated, a male rhesus is about 2 feet (60 cm) high and scales about 15-23 lb (7 to 10 kg). Females are smaller and slighter in build. The largest and heaviest animals are found in the western ranges of the Himalayas.

**Distinctive Characters**: The Rhesus has the usual squat, thickset build of a macaque. ... The orange-red fur on its loins and rump distinguishes it from any other Indian monkey.

**Distribution**: The Himalayas, Assam, and northern and central India as far south as the river Tapti in the west and the Godavari in the east. ... Three races are found in India.

**Habits**: ... Protection against cold is supplied by a heavier winter coat, always more luxuriant in Himalayan animals, some of which winter in the pine forests quite 8,000 feet (2440 m) above sea-level.
THE COMMON LANGUR or HANUMAN MONKEY

Prater, p. 39,
Plate 11 facing p. 49
Photo plate 8 facing p. 32
Local Names: Hindi - langur, hanuman; Himalayas - pahari dendoa; Kumaon - gooni; Bhotia - propyaka; Marathi - wanar; Gujarati - vandra.

Size: Seated, this langur is 2 to 2½ feet (60 to 75 cm) tall; tail, 3 to 3½ feet (90 to 100 cm). Himalayan animals, particularly from the western ranges, are the largest and heaviest; weight 35-46 lb (16-21 kg).

Distinctive Characters: This is the long-limbed, long-tailed, black-faced monkey. ... Animals from the Himalayas are more heavily whiskered and coated, their pale, almost white, heads standing out in sharp contrast to the darker colour of the body.

Distribution: Practically the whole of India, from the Himalayas to Cape Comorin except the western deserts ... Within this area some 14 more or less distinguishable races are recognised.

Habits: Langurs are more arboreal in habit than macaques, but in parts of India some have taken to living on rocks and cliffs. The proximity of water is essential to their habitat. In the Himalayas they inhabit forests almost from plains to altitudes nearing 12,000 feet (3,660 m). While many live in winter among the snow-covered pines and firs, in some parts of these mountains there is apparently a migration from higher to lower levels during this season, probably because of the scarcity of food in the snowbound higher reaches.

The big cats of the Himalayan foothills are tiger and panther. On the higher snowbound ranges there lives a rare cat which is called snow leopard. In the countryside one more cat is found which is known as jungle cat.

Cats are carnivorous animals. "Among carnivores Cats stand supreme in equipment of tooth and claw, and supreme again in that combination of grace, strength, and agility which is the mark of the tribe. An excellent fitness for a predatory life is seen in the perfect adaptation of the whole being and structure of a Cat to the swift capture, killing and eating of living prey."

THE TIGER

Prater, p. 65,
Plate 12 facing p. 64
Local Names: Hindi - bagh, sher; Central India - nahar, sela vagh; Marathi - wagh.

class Mammalia
order Carnivora
family Felidae
genus and species Panthera tigris (Linnaeus)
Size: Measured in a straight line between pegs few Indian tigers exceed 10 feet (300 cm) in length. The average is 9 to 9½ feet (275-290 cm); females, 8½ feet (260 cm). Average weight, male 400-500 lb (180-230 kg); females about 100 lb (45 kg) less. Tigers from the Himalayas generally show a slight superiority in size over tigers from Madhya Pradesh and southern India.

Distinguishing Characters: The Indian Tiger is a rich-coloured well-striped animal with a short coat.

Distribution: The Indian race, designated as the typical Tiger, is found practically throughout India from the Himalayas to Cape Comorin, except in the deserts of Rajputana, the Punjab, and Cutch.

Habits: In India the Tiger has left its tracks in the winter snows of the Himalayas at an altitude of 10,000 feet (3,050 m). It lives in humid evergreen forests, in dry open jungle, and in the grassy swamps of the terai ... . Three things are essential to the Tiger, the neighbourhood of large animals upon which it can prey, ample shade to sleep in, and water to quench its thirst. Ordinarily the Tiger hunts between sunset and dawn ... . It hunts game of all kinds ... It preys on deer, nilgai, wild pig, bears, and porcupines. ... In spite of its heavy build the Tiger is endowed with astonishing suppleness of movement. It takes to water readily and swims with ease. ... it will climb trees should need arise.

THE LEOPARD or PANTHER
Prater, p. 68,
Plate 12 facing p. 64
Photo plate 16 facing p. 78
Local Names: Hindi - tendwa, chita, sono chita, chita bagh; Marathi - karda, asnea, singhal, bibalya wagh.

Size: The average total length is 7 feet (215 cm), females about 1 foot (30 cm) less. An exceptionally large male may reach 8 feet (245 cm). Maximum weight 150 lb (68 kg), female about 110 lb (50 kg). Ordinary weights are 115 lb (52 kg) and 85 lb (39 kg). There is much variation in size in various parts of India.

Distinguishing Characters: A typical Panther ... is a sleek short-haired animal with a fulvous or bright fulvous coat marked with small close-set black rosettes. There is however considerable colour variation.

Distribution: The Indian Panther ranges over the whole country.

Habits: Panthers are able to live and thrive almost anywhere. They are not restricted to forests or heavy cover like tigers, and thrive as well in open country as among rocks and scrub. ... The Panther will kill and eat anything it can overpower with safety — cattle, deer, and monkeys, the smaller beasts of prey, and larger rodents, like porcupines. ... It displays many of the habits and ways of tigers. Like the tiger the forest Panther follows ... the beaten tracks of animals through the forest, or waits for its prey in hiding. It seizes its quarry from the ground or leaps on it from a height such as an overhanging branch. The strength of the Panther is amazing.
To find security for its kill a Panther has scrambled up a tree carrying a full-grown chital stag in its mouth.

**THE SNOW LEOPARD or OUNCE**

Prater, p. 69,
Plate 12 facing p. 64

Local Names: Hills north of Simla - barhal he; East of Kumaon - burhel haye (burhel killer).

**Size:** Somewhat smaller than a panther with relatively longer tail. Head and body, 3 ft 3 in - 3 ft 8 in (100-110 cm); tail, 3 feet (90 cm).

**Distinctive Characters:** The Snow Leopard is distinctive in the shortness of its muzzle, its high forehead, and vertical chin. The ground colour of its coat is soft grey paling to pure white on the underside. The grey is sometimes tinged with buff. The spots are unbroken and distinct on the head, nape, and lower parts of the limbs. On the body they break up into larger, paler rosettes. These rosettes are less pronounced in the luxuriant winter coat. Except for a few black blotches the fur of the undersides is pure white. Newly born cubs are darker than the adults.

**Distribution:** In India Snow Leopards range along the whole Himalayan chain from Kashmir to Sikkim.

**Habits:** Little is known about the habits of this animal. The inaccessibility of its haunts makes observation difficult. Its home is the higher altitudes of the Himalayas, in that region of stupendous rock and cliff above the tree-line, some 12,000 - 13,000 feet (3,660 - 3,965 m) above sea-level. ... Snow Leopards hunt at night, preying on wild sheep and goats, on musk deer, hares, marmots, and other rodents, perhaps also on the larger birds. ... At the onset of winter, Snow Leopards follow the general downward migration of animals, coming down with them to altitudes as low as 6,000 feet (1830 m).

... Snow Leopards are ... hunted for their valuable fur. Its soft colouring and luxuriant beauty is scarcely rivalled.

**THE JUNGLE CAT**

Prater, p. 75,
Plate 13 facing p. 65

Local Names: Hindi - khatas, jangli billi; Bengali - ban bilar; Marathi - baul, baoga.

**Size:** Head and body, little over 2 feet (60 cm); tail, about a foot (30 cm) long; weight, 10-12 lb (5-6 kg).
Distinctive Characters: With its long legs and comparatively short tail the Jungle Cat has a very distinctive appearance. Its pale green eyes give it a coldly cruel expression. The colour of its fur varies from sandy grey to yellowish grey. The tail is ringed with black towards the end and has a black tip. The paws are pale yellowish, black or sooty brown underneath. The ears are reddish, ending in a small pencil of black hairs. The underside of the body is paler, with vestiges of stripes on the underside and flanks.

Distribution: This is the common wild cat of India and is found ... from the Himalayas to Cape Comorin. The Himalayan form is distinguished by its heavier winter coat.

Habits: Jungle Cats inhabit the drier and more open parts of the country, keeping more to grassland, scrub jungle, the reedy banks of rivers and marshes. ... Its movements in the open are much like those of a small panther. It preys on small mammals, birds, and ... poultry. ... Very swift and exceedingly strong for its size, it is quite capable of bringing down larger game. Crump, writing of these Cats in Kumaon, says that it was not at all uncommon to find the quills of porcupines, which they had killed or attempted to kill, embedded in their paws.

Civets look like Cats but in structure they differ in many ways. No one would mistake a Civet for a cat. Its body is long and limbs short and its elongated head and pointed muzzle are quite distinct from the long limbs, rounded head, and flattened muzzle of a Cat. Civets are not made for a predatory life and live partly or mainly on vegetable food whereas Cats live wholly by hunting animals. Civets have keen eyes, a sharp sense of smell, and acute hearing which enable them to secure their food. They also possess stink-glands which they use for defence. In fact the scent from these glands is known as 'zabat' in Arabic and the name 'civet' is derived from it. These distinctions put them in a single family called the Viverridae.

Two civets live in the Himalayas: the one called Toddy Cat is common all over India except in deserts; the other which is known as the Himalayan Palm Civet is indigenous to the Himalayas.

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THE COMMON PALM CIVET, or
TODDY CAT
Prater, p. 92,
Plate 17 facing p. 79 and
plate 19 facing p. 97

Local Names: Hindi - Iakati,
khatas; Bengali - bhondar;
Marathi - ud manjar.

Size: Head and body, about 2 feet (60 cm); tail, of equal length; weight, 6-10 lb
(2.7 - 4.5 kg).

Distinctive Characters: A black or blackish-brown civet with long coarse hair. Underwool, when present, whitish, buff, or a rich yellow; usually hidden in the heavier winter coat. ... , the most usual pattern is a white patch or spot below the eye, sometimes one above it, and one on each side of the nose.
Distribution: Kashmir, the Himalayas, and Assam southwards through the whole of the Peninsula, except in the desert zones.

Habits: This civet is more common and abundant in well-wooded regions. It lives much on trees, lying curled up by day among the branches or in a hole in the trunk. ... They seek their food at night, in trees or on the ground, killing birds and small mammals and feeding also on fruit. ... Pineapple and coffee plantations are a favourite resort in the fruiting season; and where palms are tapped for toddy these civets are known to climb the trees to steal the sweet juice which collects overnight in the pots.

THE HIMALAYAN PALM CIVET
Prater, p. 92;
Plate 17 facing p. 79 and plate 19 facing p. 97

<table>
<thead>
<tr>
<th>class</th>
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<tbody>
<tr>
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<tr>
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<td>Viverridae</td>
</tr>
<tr>
<td>genus and</td>
<td>Paguma larvata</td>
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Size: Average length of head and body, 2 feet (60 cm); tail, about the same; weight, 8-11 lb (3.6 - 5.0 kg).

Distinctive Characters: The Himalayan Palm Civet is distinguished from other Indian civets by its white whiskers and by the absence of any trace of spots or stripes on its body. Its coat ranges from uniform grey to tawny; the underparts white. Underwool brownish, grey, or sooty. Facial markings, variable; usually a white band on the forehead and nose, another beneath the ears passing over the cheeks, and a blotch below each eye.

Distribution: Kashmir, western, central, and eastern Himalayas, and the Assam hill ranges.

Habits: The habits of the Himalayan Palm Civet are very similar to those of the Common Palm Civet. It lives in mountain hill forests sheltering in holes in trees, and hunting its food in the treetops or on the ground. In diet, it is perhaps more of a vegetable feeder than the Common Palm Civet. It lives mainly on fruit; but like all civets it preys on such small animals and birds as it can capture and kill. ... 'very cleanly, its body ordinarily emitted no unpleasant smell but, when it was irritated, it exhaled a most unpleasant stench, caused by a discharge of a thin yellow fluid from four pores, two of which are placed on either side of the anal opening.'

Mongoose! Who has not seen it with the Indian snake charmers? Many stop by the roadside to watch a fight between a cobra and a mongoose. It is a small animal which differs from civets in some respects and hence placed in a family called the Herpestidae. Mongoose has smaller ears than those of civet and their shape too is different. Besides, it is more predatory than civet. The mode of hunting too is different: civet preys by stealth and ambush whereas mongoose prefers a direct, open and headlong attack. Mongooses too have anal stink glands but all species do not use them for defense — a habit unknown among civets where all species use the gland for defense.
THE COMMON MONGOOSE
Prater, p. 101,
Plate 24 facing p. 112
Local Names: Hindi - mangus,
newal, newara; Marathi -
mungoos; Gujarati - nurulia.

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<td>Herpestidae</td>
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<tr>
<td>genus and</td>
<td>Herpestes edwardsi</td>
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<td>species</td>
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Size: Total length, nearly 3 feet (90 cm) of which 18 in (45 cm) is tail; average
weight, about 3 lb (1.4 kg). Males considerably heavier and larger than females.

Distinctive Characters: Tawny yellowish-grey with no stripe on the side of its
neck. The alternate light and dark rings on its hairs give its coat a grizzled 'pepper
and salt' tinge. The tail, which is as long as its body, is tipped with white or yellowish-
red, never black.

Distribution: The whole of India from the Himalayan foothills to Cape Comorin.

Habits: This is not a creature of forest, but of open lands, of scrub jungle, and
cultivation. It lives in hedgerows and thickets, among groves of trees and cultivated
fields, taking shelter under rocks or bushes, lying up in a hollow in the base of
a tree trunk, or digging a hole for itself in the ground. ... Termite mounds are some-
times occupied. ... They prey on rats and mice, on snakes, lizards and frogs, insects,
scorpions, and centipedes, in fact on anything that can be overcome. Birds' eggs
are eaten.

Mongoosees and snakes go together and hence we quote a note on them by Prater:
"Mongoosees prey upon snakes, often on highly venomous species like cobras. How
does the mongoose protect itself against so deadly a foe? Its strategy may be a
headlong frontal attack, or a more circumspect waiting for opportunity such as the
seizure of the lowered head after the snake strikes. What protects the mongoose
is its extreme agility in evading a bite. Other factors which prevent a fatal issue
is the mongoose's way of bristling hairs of its body. Under stress of excitement
the hairs stand erect making the mongoose appear twice as large as it really is.
This might easily cause the snake to strike short. ... It is true that the mongoose
is less sensitive to the venom of snakes and is able to withstand doses of poison
potent enough to kill other animals of equal size. But the immunity is by no means
absolute. A mongoose well and truly bitten and injected with venom in sufficient
quantity dies from the poison like other animals. Such partial immunity is not especial
to the mongoose. Certain animals like pigs and hedgehogs display similar powers
of resistance to snake venom. Cats for instance are less affected by it than dogs,
and pigs to a lesser extent than cats."

The dog family is represented by wolves, jackals, foxes and wild dogs. A hyena
[ Hyaena hyaena (Linnaeus) ] is neither a dog nor a cat but a mixture of both, and
hence, is ungainly and of heavy build. Its structure is not suited for the beast of
prey but for a scavenger, and in the scheme of nature it is assigned the scavenging
task. We will not consider it because it is not a Himalayan animal. Wolves, on the
other hand, belong to the desert zone and dry open plains of India but chiefly found
in some parts of Kashmir, Ladakh and Tibet and are represented by a genus Canis
lupus Linnaeus. They do not frequent Kumaon and Garhwal and hence we will omit
them too. This leaves us with jackals, foxes and wild dogs. The family is known as Canidae.

The characteristics of the dog family are a well-shaped head, long pointed muzzle, large erect ears, deep-chested muscular body, bushy tail, and slender, sinewy limbs which are suited to secure prey by swift and open chase.

**THE JACKAL**
Prater, p. 126,
Plate 25 facing p. 113

Local Names: Hindi - gidhar, kola; Marathi - kolha; Bengali - shial.

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<tr>
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<tr>
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<td>Canidae</td>
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<tr>
<td>genus and species</td>
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**Size:** Height, about 15 - 17 in (38 - 43 cm); length, head and body, 2 - 2½ feet (60-75 cm); tail, 8-11 in (20-27 cm); weight, 17-25 lb (8-11 kg). Animals from north India are on the average bigger and heavier in build.

**Distinctive Characters:** The Jackal's long-drawn, eerie howling at dusk or just before dawn is perhaps more familiar to most people than the animal itself. Its nearest wild relative is the wolf, but the Jackal is smaller in build. ... It lacks the arching brows and elevated forehead which give the wolf its nobler profile. Coat, variable with season and locality. Typically, a mixture of black and white washed with buff about the shoulders, ears, and legs. Himalayan animals have more buff on their coats and a deeper tan on ears and legs. Black variants are not uncommon in north India.

**Distribution:** ... throughout India ... Three Indian races are recognised.

**Habits:** Jackals live in almost any environment. ... They have been found at a height of 12,000 feet (3,660 m) in the Himalayas and are well-established round hill-stations 4,000-7,000 feet (1,220-2,135 m) above sea-level. The greater number ... sheltering in holes in the ground ... come out at dusk and retire at dawn. ... They do good work in the clearance of carcasses and offal, providing, with vultures, the only sanitary service known to many of our towns and villages. The hunting instinct is not wholly dormant. ... Any small or wounded animal may be attacked.

**THE RED FOX**
Prater, p. 127,
Plate 25 facing p. 113

Local Names: Hindi - Lomri, English - Hill Fox (Himalayas).

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<tr>
<td>order</td>
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<tr>
<td>family</td>
<td>Canidae</td>
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<tr>
<td>genus and species</td>
<td>Vulpes vulpes (Linnaeus)</td>
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</table>
**Size:** Length of head and body 2 ft - 2 ft 4 in (60-70 cm); tail inclusive of hairs, 18-20 in (45-50 cm); weight, 10-12 lb (4.5 - 5.5 kg).

**Distinctive Characters:** A richly coloured fox with long silky fur and a superb brush. The black backs to the upper half of its ears and the white tip to its tail distinguish it from other Indian foxes. Red is the dominant colour of its lovely coat, but this is very variable; bright yellowish, grey, silvery, and black individuals occur. In spring, when the luxuriant winter coat is shed, the Red Fox is scarcely recognizable; the dark under-fur showing through the mounting coat gives it a grey-brown tinge.

**Distribution:** Within Indian limits, Ladakh, Kashmir, and the Himalayas as far east as Sikkim, extending into the desert zone of north-western India. Three races of the Red Fox are recognised from India: a mountain form, the Hill Fox (montana) exists in the Himalayas.

**Habits:** In the Himalayas it is common in brushwood and cultivated lands; this, and not forest, is its chosen habitat. Red Foxes shelter in a burrow dug in the ground, or under or among rocks. They usually hunt alone or in pairs. Ground birds like partridges and pheasants are killed and, in the Himalayas, their rodent fare includes squirrels, marmots, voles, and mouse-hares.

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**THE INDIAN FOX**
Prater, p. 129,
Plate 25 facing p. 113

**Local Names:** Hindi - Iomri,
Iom, lokri, lokeria, Marathi - kokri.

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<tr>
<td>order</td>
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<td>family</td>
<td>Canidae</td>
</tr>
<tr>
<td>genus and species</td>
<td>Vulpes bengalensis (Shaw)</td>
</tr>
</tbody>
</table>

**Size:** Length of head and body, 1½ - 2 feet (45-60 cm); tail, 10 - 14 in (25 - 35 cm)
weight, 4 - 7 lb (1.8 - 3.2 kg.)

**Distinctive Characters:** This is the common fox of the Indian plains, a pretty, slender-limbed animal, smaller and slimmer in build than the Red Fox; distinctive in the black tip to its tail. Northern animals grow a handsome winter coat ... not as long and luxuriant ... of the Red Fox. Its general colour is grey, purer grey in winter, contrasting with the rufous limbs.

**Distribution:** The whole of India from the foothills of the Himalayas to Cape Comorin.

**Habits:** The Indian Fox keeps to open country and rarely enters forest. It is common in the waste and scrub of our desert zone, but not in true desert. ... The ... Fox lives in a burrow dug by itself in open ground or in scrub. ... The burrow always has several openings, some blind, others leading to a central chamber, 2 - 3 feet (60-90 cm) below the ground. ... In the gathering darkness its chattering bark is heard, a sharp yelp repeated three or four times. ... Small mammals, reptiles, and insects, rather than birds, are what this fox eats. ... Melons, ber fruit, and the shoots and pods of Cicer arietum are eaten in season.
Its main defence against enemies is its speed and the dextrous way in which it twists and turns and doubles on its course, using its tail to balance its movements. The tail ... is carried horizontal when on the run, and flicked up erect when twisting and turning.

**THE Dhole, or INDIAN WILD DOG**
Prater, p. 130,
Plate 25 facing p. 113

Local Names : Hindi - dhole, son, ram, jangli kutta, ban kutta; Marathi - kolsum, kolsa, kolsara; ... Himalayas - bhaosa, bhoonsa, buansu; Kashmiri - ramkun.

**Size** : Height, 17-22 in (43-55 cm) at the shoulder; head and body, about 3 feet (90 cm) in length; tail, 16-17 in (40-43 cm); weight, a big male scales 43 lb (20 kg), females are lighter.

**Distinctive Characters** : Much like a domestic dog in general appearance, with the long, lank body of the wolf, but relatively shorter in leg and muzzle. The ears are more rounded at the tip and the tail quite bushy. ... Very distinctive is its red coat, which varies in tone with season and locality. ... those from the Himalayas are a deeper red, ...

**Distribution** : ... the forest regions of India. ... Within the limits of India three races are recognised, a trans-Himalayan, a Himalayan, and a peninsular form.

**Habits** : ... in ... India they keep entirely to forests. ... Usually Wild Dogs hunt by day, rarely by night. Their prey is trailed by scent and pursued at sight, with no violent outburst of speed ... Tahr are hunted in the Himalayas, but their usual prey in India are various species of deer, large and small. A large pack may attack large animals like gaur and buffalo. Their usual way is to stampede the herd and attack the calves. Wild pigs are a favourite prey. Panther and bear and even tigers have been attacked and killed.

To a common man bears and dogs are totally dissimilar animals but to zoologists they are of a common ancestral stock. Like dogs, bears have a dominant smell sense, but unlike dogs, they are poor of hearing and sight. This makes them dull and 'there is no knowing what a bear will do or how it will react to set conditions.' For this reason bears are considered more dangerous than any other carnivorous animal even though by inclination they are vegetarians and eaters of insects. Rarely do they attack and kill other animals for food.

In India, there are three genera of bear: the Sloth bear, the Brown bear and the Himalayan Black bear. Of these the Sloth bear [Melursus ursinus (Shaw), Prater, p. 139, plate 30 facing p. 130] is common and found in the forested tracts of India and Assam from the base of the Himalayas to Ceylon. A whitish V-shaped breast patch is its distinguishing mark. The other two bears are Himalayan animals and we will consider them here.
THE BROWN BEAR
Prater, p. 140,
Plate 30 facing p. 130

Local Names: Hindi - barf ka rinch, lal bhalu, safed bhalu, sialis reech; Kashmiri - haput; English - Red Bear.

Size: As with all bears, very variable. Males average 5 ft 8 in (170 cm) in length, females a foot less. A very big male may be 7 to 8 feet (210 to 245 cm) long.

Distinctive Characters: Its heavier build and brown coat will suffice to distinguish it from the Himalayan Black Bear. The brown varies individually and seasonally from dark to light, white tips to the fur may give the coat a silvery tinge. Usually the coat becomes tawny or red-brown when old and worn; a darker, richer brown when grown new in the summer, and long, luxuriant, and heavily furnished with underwool before the onset of winter.

Distribution: ... the north-western and central Himalayas. ... The Indian race is said to be distinctive by its paler coat and smaller build.

Habits: The bare open peaks high above the tree-line are the usual haunt of these bears. Emerging from their winter sleep in the spring, they follow the melting snows up to their perpetual level. At this season and in the early summer they graze like cattle on the newly-grown grass, and spend much of their time turning over stones to look for insects, or hunting voles and marmots, which they dig out of their burrows. ... it never becomes a man-killer ... Later in summer or early autumn the bears come down to the lower reaches. It is the fruiting season when berries and wild fruit are to be had in the forests ... Most of this fruit is taken from the ground. Brown Bears seldom climb, and much of their diet at this time is limited to grass, roots, and tubers ... with ... heavy falls of snow, ... the Brown Bear goes into some shelter under rocks, in a cave or a den dug out by itself to pass the season of adversity in torpid sleep, buried deep under the snow.

THE HIMALAYAN BLACK BEAR
Prater, p. 141,
Plate 30 facing p. 130

Local Names: Hindi - reech, rinch, bhalu; Kashmiri - haput; ... Bhotia - dom.

Size: Males vary from 4 ft, 8 in to 5 ft, 5 in (140 to 165 cm); a large male measured 6 ft, 5 in (195 cm) from nose to rump; females, about 5½ feet (170 cm). A male in the autumn may scale 400 lb (180 kg) when fat with high feeding; average weight, 200-250 lb (90-115 kg).
Distinctive Characters: Its shorter smoother coat and black claws distinguish it at once from the Sloth Bear. Its build is less clumsy and more compact. General colour, typically black; muzzle, tan or brown; chin, white or buff: very characteristic is the V-shaped breast-mark which may be white, yellow, or buff. ... underwool ... is well developed in west Himalayan animals, especially in winter.

Distribution: In India, Kashmir, the Himalayas, and Assam.

Habits: Steep forested hills are the favoured habitat of this bear. In the Himalayas during summer they may be found near the limits of the tree-line 10,000-12,000 feet (3,050-3,660 m) above sea-level, but in winter most of them come down to the lower valleys, 5,000 feet (1,525 m) and even lower—we have been encountered in the Terai jungles. ... The Himalayan Black Bear spends the day sleeping in a rock cave or in the hollow of a tree. It comes out at dusk to seek its food and retires after sunrise. Food varies with season. In summer they live largely on wild fruit and berries. ... Being expert climbers much of their food is taken from the tree-tops. This is the season when honey is to be had ... of the little bee (Apis indica) which builds its hive in hollow tree stems. ... Insects, termites, and the larvae of beetles provide variety to this diet. It is the most carnivorous of the bears, ... Many people are killed or mauled by these animals.

So far we have considered some of our large carnivores which we have seen in zoos or heard about. Now we consider some of our small carnivores which are in no way less attractive but are little known to us. They are placed as a group in the Weasel Family — the Mustelidae, even though they look different from each other. These animals are: Otters, Martens, Weasels, Ferret-Badgers, Badgers and Ratels. Otters are great swimmers and their body is specifically made to prey on fishes. They readily take to land but get about clumsily. Martens, on the other hand, are great climbers: they leap from branch to branch and run over the treetops. They seek their food in trees. Weasels are neither aquatic nor arboreal: they seek their food in burrows because they are made for underground work even when they can climb and take to trees readily in forests. Badgers like weasels seek their food in burrows but they are great diggers and make their own burrows as they are made for fossorial life. As such true badgers are not found in India, but hog -badgers have more or less the same general characteristics. A ferret-badger is a mixture of weasel and badger and is not completely terrestrial in habit but has an aptitude for climbing. A ratel looks much like a badger but, unlike the latter, is a highly predatory animal.

In India, the otter is represented by three genera, of which, the Smooth Indian Otter [Lutra perspicillata I. Geoffroy, Prater, p. 152, plate 31 facing p. 131] ranges from the Himalayas and Sind to the extreme south, is essentially a plains otter and is omitted here. Badgers — Ferret and Hog — belong to the eastern India and we have by-passed them too. The Ratel or Honey Badger [Mellivora capensis (Schreber), Prater, p. 162, plate 33 facing p. 143], which is found from the base of the Himalayas to Cape Comorin, lives in the desert and avoids regions of heavy rainfall. This makes it an outsider for us and we skip it too.

We take up now the remaining members of the Weasel family.
THE COMMON OTTER
Prater, p. 151, Plate 31 facing p. 131
Local Names: Hindi - ud, ud bilao, pani kutta.

- class: Mammalia
- order: Carnivora
- family: Mustelidae
- genus and species: Lutra lutra (Linnaeus)

Size: Head and body, 2 ft to 2 ft 8 in (60 to 80 cm); tail, 1½ feet (45 cm).

Distinctive Characters: The distinctive characters of otters as a group have been discussed. The present species can be distinguished from other otters found in India by its fuller, rougher coat, and by its grizzled dorsal surface due to the pale tips of the longer hairs.

Distribution: In India the Common Otter is found only in Kashmir, the Himalayas, and Assam, and nowhere in the Peninsula except in south India.

Habits: In India this is essentially an otter of cold hill and mountain streams and lakes. It makes its lair among rocks and boulders, in hollows beneath the roots of trees growing by the water's edge, or it lies up in reed beds, fern brakes, and bushes. Bones and scales of fish, and the web-footed tracks of the animal round the den show whether the owner is in residence or not. In summer in the Himalayas and Kashmir many otters go up the streams and torrents ascending to altitudes of 12,000 feet (3,660 m) or more. Their upward movement probably coincides with the upward migration of carp and other fish for purposes of spawning. With the advent of winter they come down to the lower streams. Much of this journeying from stream to stream is done overland. Fish is their main food.

THE CLAWLESS OTTER
Prater, p. 154, Plate 31 facing p. 131

- class: Mammalia
- order: Carnivora
- family: Mustelidae
- genus and species: Aonyx cinerea (Illiger)

Size: The smallest of our otters. Head and body, 18-22 in (45-55 cm); tail, 10-13 in (25-35 cm); weight, 6-13 lb (3-6 kg).

Distinctive Characters: Its name indicates its distinctive character. The claws of these otters are rudimentary; ... Colour: dark brown above, paler below.

Distribution: The Himalayan foothills ... to the Assam hill ranges, plains of Assam, and lower Bengal. Nowhere else in India except the higher elevations of hill ranges of Coorg and the Nilgiris, the High Range, and the Palnis.
Habits: In northern India, it is found only on the lower slopes of the Himalayas ... where it hunts in streams, rivers, ... the Clawless Otter is said to feed less on fish and to live more on crabs, snails, mussels, and other aquatic creatures...

THE BEECH, or
STONE, MARTEN
Prater, p. 155,
Plate 31 facing p. 131

<table>
<thead>
<tr>
<th>class</th>
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<tbody>
<tr>
<td>order</td>
<td>Carnivora</td>
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<tr>
<td>family</td>
<td>Mustelidae</td>
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<tr>
<td>genus and</td>
<td>Martes foina (Erxleben)</td>
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<tr>
<td>species</td>
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Size: Head and body 10 to 17 in (25 to 45 cm).

Distinctive Characters: A graceful slender marten, with moderately long legs, and tail about half as long as its head and body. Its build suggests a mixture of squirrel and cat. The colour of its upper side is almost uniform drab or slaty brown, dark or light and never varied with black or yellow; nor is the white of its throat set off by dark bands running down the neck, both characters so marked in Yellow-throated Martens. In the Himalayan form the white of the throat is generally broken up by brown patches or even completely obliterated.

Distribution: In India, only Kashmir and the Himalayas as far east as Sikkim.

Habits: Stone Martens inhabit the temperate and alpine zones of the Himalayas and are rarely found below 5,000 feet (1,525 m). They live both in forest and on the barren heights above the tree-line, sheltering in hollows in trees, under logs, among rocks, or in holes in the ground. They hunt by day or by night, preying on any creature which they can capture and overcome. What they hunt and eat varies with season and locality. In the higher levels of the Himalayas they prey largely on voles and mouse-hares living in this treeless terrain. Forest dwellers have a wider range of food. They hunt much in trees, pursuing squirrels and stalking and pouncing on birds. This diet of flesh is varied in season with honey, nuts, and fruits. Stone Martens are said to be especially fond of cherries.

THE HIMALAYAN
YELLOWTHROATED MARTEN
Prater, p. 156,
Plate 31 facing p. 131

Local Names: Garhwal - chitrola (male), chitroli (female); Bhotia - shingsam, humiah.

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<tr>
<th>class</th>
<th>Mammalia</th>
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<tbody>
<tr>
<td>order</td>
<td>Carnivora</td>
</tr>
<tr>
<td>family</td>
<td>Mustelidae</td>
</tr>
<tr>
<td>genus and</td>
<td>Martes flavigula (Boddart)</td>
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<tr>
<td>species</td>
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Size: Head and body, 18-24 in (45-60 cm); tail, 15-17 in (38-43 cm).
Distinctive Characters: A larger animal than the Stone Marten, with a proportionately longer tail measuring about three-fourths the length of head and body. The colour varies among individuals and with season, but it is never the uniform brown or grey-brown of the Stone Marten. The dorsal fur is usually variegated with deep brown, black, and yellow, and the yellow of the throat is emphasized by dark bands running down the nape.

Distribution: In India, the Himalayas and the Assam hill ranges.

Habits: ... In the Himalayas they keep to forest limits and are not found above the tree-line. Here they live in the temperate forest belt between 4,000 feet (1,220 m) and 9,000 feet (2,745 m) and are ... found ... almost down to plains level. ... Like all their family these martens are restless creatures. They hunt both by day and by night, on the ground but more commonly in trees. ... In the treetops they display extreme agility, leaping from branch to branch or coursing along and under boughs. Speed of movement and great boldness in attack make them a real menace ... In the treetops they hunt squirrels and birds, raid nests for eggs and young. On the ground their usual quarry is rats and mice, hares, pheasants, and partridges, ... Their diet is varied with fruit and honey from flowers. Thrusting its pointed snout into the great scarlet blooms of the silk cotton tree, the marten sucks up the abundant nectar. It is one of the many animals which assist in the pollination of these flowers.

THE HIMALAYAN WEASEL
Prater, p. 157,
Plate 32 facing p. 142

class Mammalia
order Carnivora
family Mustelidae
genus and species Mustela sibirica Pallas

Size: Head and body, about 1 foot (30 cm); tail, 6 in (15 cm).

Distinctive Characters: Colour varying from bright foxy red to dark chocolate, no sharp contrast between upper and underparts, which are but slightly paler. The colour of the muzzle is dark in some forms, more or less white in others; the extent of white on the chin and throat also varies. Paws, same tone as legs except for a few scattered white hairs, or spots. The Himalayan races are: a dark-muzzled form (suhemachalana), a white-muzzled form (canigula), and a third race (hodgsoni) in which the white of the muzzle does not extend as far as the eyes.

Distribution: The Himalayas.

Habits: In the Himalayas this weasel lives in temperate and alpine forests and in the open grass and scrub above the tree-line at altitudes ranging from 5,000 - 16,000 feet (1,525 - 4,880 m). ... It makes its den in any convenient shelter, among rocks, under roots of trees, in hollow stumps or logs, and quite often in the burrow of some other animal. ... They may hunt by day, but more usually come out after nightfall. A weasel covers much ground walking slowly with back arched, or moving...
swiftly in a series of rapid easy bounds. It trails its prey by scent, stopping now and then to stand erect and peer about. Ever restless and on the move, it thrusts itself in and out of thickets and brush-wood, holes, and crevices. Weasels hunt for rats and mice, birds and birds' eggs, reptiles, and even eat insects. ... A weasel has all the boldness and courage of its family, attacking and killing for food animals larger than itself. The prey, paralyzed with terror, may be killed without any effort at self-defence. Should it resist, the weasel, its long neck thrust out, its head a-swaying, eyes a-glitter, awaits its chance to spring. Its attack is always aimed at some vital part, the head or the back of the neck, to bite down to the brain or spine, or to the side of the throat to sever the jugular vein. A perfect killing machine, it kills with deadly efficiency.

There are some other beautiful Himalayan weasels, which are found in Chitral, Hazara and Kashmir and also in the upper reaches of mountains. These are shown in Prater's book on plate 32 facing p. 142. The one called Yellowbellied Weasel [ Mustela kathiah Hodgson (plate 32 facing p. 142) ] "ranges from the western Himalayas eastwards to Assam. Like the Himalayan Weasel [Mustela sibirica] it has dark paws, but is distinctive in the sharp contrast between the dark chocolate-brown of its upper parts and the sharply defined rich yellow of the under surface. Finally, there is the Striped-backed Weasel [ Mustela strigidorsa Gray (plate 32 facing p. 142) ] a rare animal, distinctive in the white or whitish streak along its back and belly. It lives in temperate forests ranging between 4,000 feet (1,220 m) and 7,000 feet (2,135 m). The general habits of these animals do not differ essentially from the species described above."

The natural order of carnivora is followed by that of insectivora, that is of insect-eating mammals. Insects are small creatures and their eaters too are not big animals. They live wherever insects are found, that is, on the surface of the ground, underground and in the trees. Thus these animals have acquired diversity of form and structure : the tree shrews are climbers, ground shrews and hedgehogs are runners along the hedges in the fields, and moles love burrows. The characteristic feature of all these insectivores is 'a long, pointed snout projecting far beyond the lower jaw, at times it is almost a proboscis.' They are grouped into four families : Tupaiidae (tree shrews), Erinaceidae (hedgehogs), Talpidae (moles) and Soricidae (ground shrews). The last family is recognised by the Hindi name 'chhachhundar'.

Of the four families mentioned here, which ones are found in Uttarakhand cannot be decided from Prater's book. The Indian Tree Shrew [Anathana elliotti (Waterhouse), Prater, p. 164, plate 38 facing p. 160] is found in forests of peninsular India, south of the Ganges. The Longeared Hedgehog [Hemiechinus auritus (Gmelin), Prater, p. 166, plate 38 facing p. 160] is mainly confined to the desert zones of India. The Eastern Mole [Talpa microura Hodgson, Prater, p. 167, plate 38 facing p. 160] occurs in the central and eastern Himalayas, and in the Assam hills. It is common around Darjeeling. And finally, the Grey Musk Shrew [Suncus murinus (Linnaeus), Prater, p. 168, plate 38 facing p. 160; Hindi chuchunder; Marathi chichundri] is distributed throughout the Indian peninsula and its variants in the hills.

The bats are flying mammals which are not close to birds but to insect-eating mammals. In the early stage all bats were insect-eaters. Today a few of them have taken to fruit-eating but on the whole most of them are insectivores. This difference in the eating habit of bats leads to two groups: Megachiroptera and Microchiroptera.
The former are the fruit bats which are large and the latter are the insect-eating bats which are small. "The name Chiroptera given to bats is a combination of the Greek words chieros, a hand and pteron, a wing. It describes exactly the structural plan of a bat's wing. A bat's arms and hands are the framework of its wings. They are built on the usual pattern of the vertebrate forelimb. There is the upper arm ending at the elbow, the double-boned forearm ending at the wrist, and the hand with a thumb and four fingers. The thumb is free, the fingers are enormously lengthened and embedded in the leathery wing membrane to support it. Like the ribs of an umbrella, they open and close the wing and keep it taut when expanded. The jointed finger-bones give the bat's wing its special flexibility. The facile movements of the joints adapt the wing to the twists and turns of flight, and adjust its surface to changing currents of air. A drawing together of the fingers reduces the wing expanse "takes in sail" so to speak, and instantly checks speed and momentum. In its flexibility, its power of controlling momentum, the wing of a bat is the most perfect flying organ devised by Nature."

Bats like birds can fly and change their places easily. However, bats unlike birds do not fly to establish new territories but like to live under particular conditions of environment. For example, fruit bats do not live in the temperate levels of the Himalayas except as seasonal or nightly visitors in fruiting time. There is however an exception to the general rule and this comes about due to favourable living conditions: Caves are the favoured retreat of many bats. Why? Because they provide the uniform conditions of temperature which bats love. 'The Rousette, or Fulvous Fruit Bat [ Rousettus leschenaulti (Desmarest)] (Plate facing p. 161), a habitual cave dweller, has established itself at an altitude of 7,000 feet (2,150 m) in the Himalayas, a height at which no other Indian fruit bat is permanently resident. This bat, like other fruit bats, is a tropical species. It is able to exist in a temperate clime because it is a habitual cave dweller while other fruit bats live in trees. ... Cold profoundly influences the habits of bats.' In fact, the majority of the northern bats hibernate in winter but their winter sleep is never profound as they become active the moment a warm spell intervenes. Hibernation enables them to tide over the scarcity of food when winters are severe. However, 'little is known of the hibernation or migration of bats in India. ... various tropical species which visit the temperate levels of the Himalayas in spring and summer leave this zone on the approach of winter. The Indian Pipistrelle, common at Simla at other times of the year, completely disappears in winter'.

THE INDIAN PIPISTRELLE
Prater, p. 171,
Plate 40 facing p. 176

<table>
<thead>
<tr>
<th>class</th>
<th>Mammalia</th>
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</thead>
<tbody>
<tr>
<td>order</td>
<td>Chiroptera (micro)</td>
</tr>
<tr>
<td>family</td>
<td>Vespertilionidae</td>
</tr>
<tr>
<td>genus and species</td>
<td>Pipistrellus coromandra (Gray)</td>
</tr>
</tbody>
</table>
THE GREAT HIMALAYAN LEAFNOSED BAT
Prater, p. 176,
Plate 39 facing p. 161

<table>
<thead>
<tr>
<th>class</th>
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</tr>
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<tbody>
<tr>
<td>order</td>
<td>Chiroptera (micro)</td>
</tr>
<tr>
<td>family</td>
<td>?</td>
</tr>
<tr>
<td>genus and species</td>
<td>Hipposideros armiger</td>
</tr>
</tbody>
</table>

The small carnivores prey on small herbivores. These herb-eating animals come under the order Rodentia and include squirrels, marmots, rats, mice and porcupines. They are too many in number. They have one character in common which distinguishes them from all other mammals. It is their teeth which are 'sharp, chisel-shaped cutting implements'. They break up food by 'gnawing, scraping or nibbling' with their front incisor teeth. They do not have any canine teeth. They live everywhere except in the polar regions.

The order of Rodentia is divided into families of which four are of interest to us. These are: Sciuridae (squirrels and marmots), Muridae with two sub-families Gerbillinae (gerbilles) and Murinae (rats and mice), Rhizomyidae (bamboo rats), and Hystricidae (porcupines).

All have seen squirrels and they need no introduction. Prater's book contains pictures of ten species: four of them are in plate 41 and the rest are in plate 44. Plate 41 depicts the flying and the giant squirrels. Perhaps none of these are found in Uttarakhand. The commonest Large Flying Squirrel north of Ganga in the western Himalayas is the Red Flying Squirrel [Petaurista p. auriventer (Gray); Prater, p. 195]. 'It has a bright chestnut or bay-coloured coat and salmon-buff underparts.' The other Himalayan squirrels are in plate 44. Of these, the Orangebellied Himalayan Squirrel [Dremomys Iokriah (Hodgson), Prater, p. 199, plate 44 facing p. 196] and the Hoarybellied Himalayan Squirrel [Callosciurus pygerythrus (Geoffroy), Prater, p. 199, plate 44 facing p. 196] chiefly belong to Sikkim. They may also be found in Nepal, Bhutan and Assam. The eastern Himalayas and Assam possess one more squirrel: it is the Particoloured Flying Squirrel [Hylopetes alboniger (Hodgson), Prater, p. 196, plate 44 facing p. 196], which is a 'hoary or blackish squirrel with white underparts.' In the western Himalayas the common species of Small Flying Squirrel is the Kashmir Flying Squirrel [Hylopetes fimbriatus (Gray), Prater, p. 196, plate 44 facing p. 196]. 'Its fur is light and buffy brown more or less suffused with black. It is found at elevations ranging from 6,000 feet (1,830 m) to the limits of the tree-line.'

The Flying Squirrels are essentially forest animals and have somewhat similar general habits. They are nocturnal and emerge from shelter at dusk and retire before dawn. Their roost is a hole in a tree. They eat fruits and nuts of various trees. 'The smaller Flying Squirrels of the Himalayas feed commonly on the leaves and buds of various conifers.'

The Giant Squirrels are not found in the western Himalayas. In Nepal, Sikkim, Bhutan and Assam there is the Malayan Giant Squirrel [Ratufa bicolor (Sparrmann), Prater, p. 198, plate 41 facing p. 177]. These squirrels live only in forests and
keep to the summits of the higher trees and seldom come down. They are shy and
are not easy to discover. They are heard but not seen.

The Himalayan rodents which belong to the squirrel family (Sciuridae) are marmots.
They are all burrowers and live in holes made in the ground. We will describe them
in some detail.

<table>
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<tr>
<th>THE HIMALAYAN MARMOT</th>
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<tr>
<td>AND</td>
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<tr>
<td>THE LONGTAILED MARMOT</td>
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<tr>
<td>Prater, p. 202,</td>
</tr>
<tr>
<td>Plate 41 facing p. 177</td>
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</tbody>
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<table>
<thead>
<tr>
<th>class</th>
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<tbody>
<tr>
<td>order</td>
<td>Rodentia</td>
</tr>
<tr>
<td>family</td>
<td>Sciuridae</td>
</tr>
<tr>
<td>genus and</td>
<td></td>
</tr>
<tr>
<td>species</td>
<td>Marmota bobak (Muller)</td>
</tr>
<tr>
<td></td>
<td>and Marmota caudata (Jacquemont)</td>
</tr>
</tbody>
</table>

Distinctive Characters: Marmots are distinctive in their stout, squat build, short
or moderate tails, and very small ears. Our two common marmots are the Himalayan
Marmot and the Longtailed Marmot. The Himalayan Marmot is about 2 feet (60 cm)
long with a 5 in (13 cm) tail. Its body and limbs are pale tawny much mixed with
black on the upper parts. The face and terminal third of the tail are dark brown.
The Longtailed Marmot is handsomer and more richly coloured. Its fur is yellowish
tawny, deep orange, or rufous; the back is chiefly black, sometimes wholly black.
In size it is about as large as the Himalayan Marmot; but very distinctive is its
longer tail, which is 1 foot (30 cm) or longer.

Distribution: The Himalayan Marmot is found in Nepal, Sikkim, Garhwal, Kashmir,
and Ladakh. The Longtailed Marmot inhabits the mountain ranges to the north of
the valley of Kashmir extending into Gilgit and Ladakh.

Habits: The Himalayan Marmot lives at altitudes ranging from 13,000 (4,000 m)
or 14,000 (4,300 m) to 18,000 feet (5,500 m). The Longtailed Marmot is found at
levels between 8,000 (2,400 m) and 14,000 feet (4,300 m). They live in large colonies
excavating deep burrows in which they hibernate through the winter. With the coming
of spring they emerge, and till the autumn find food enough to sustain them, roots,
leaves, grasses, and the seeds of various plants. On fine days one may see marmots
feeding outside their burrows. When disturbed, one or more sit up on their haunches
to look around. Scenting danger they utter a loud whistling scream which sends
their comrades headlong into shelter.

The next family of the order Rodentia is the Muridae, which with gerbilles,
rats and mice forms the largest and most numerous family of rodents. They live
everywhere in India and some species are bound to turn up in the foothills of the
Himalayas. 'A gerbille is at once distinguishable from a rat by its tail. It is not
bare or naked, but clothed with hair, and usually ends in a tassel.' (See Prater,
p. 203, plate 45 facing p. 197.) The Indian rats and mice are grouped as follows:
field rats, bush or tree rats and household rats. These rodents have scaly naked
tails and rats are bigger than mice and have hairy bodies. The Indian Mole-Rat
is called 'ghus' in Marathi. The metads are the softfurred field rats. All these rodents are described in Prater's book between pages 203 and 212.

The rodents which are quite common in Kumaon are voles. There are several races of this animal in the Himalayas of which Royle's Vole is of interest to us.

<table>
<thead>
<tr>
<th>ROYLE'S VOLE</th>
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<tbody>
<tr>
<td>Prater, p. 213,</td>
<td>class</td>
</tr>
<tr>
<td>Plate 45 facing p. 197</td>
<td>Mammalia</td>
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<tr>
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<tr>
<td></td>
<td>Rodentia</td>
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<tr>
<td></td>
<td>family</td>
</tr>
<tr>
<td></td>
<td>Muridae (Microtinae)</td>
</tr>
<tr>
<td></td>
<td>genus and species</td>
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<tr>
<td></td>
<td>Alticola roylei (Gray)</td>
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</table>

Size: Body length, 3 to 4 inches (8 to 10 cm).

Distinctive Characters: ... Voles are not exactly rat-like. They are mainly burrowers, and have bodies adapted to this purpose. The muzzle is short, the head rounded, and the ears small; the body more or less cylindrical. The tail in all the Indian species is less than half the length of the body. The thumb is short, sometimes clawless, more often it bears a little compressed claw. The teeth are distinctive. The grinders have flat crowns, ... They are well adapted to the hard diet of coarse grasses and roots upon which Voles live.

Distribution: In India, voles are found only in the higher levels of the Himalayas, Kashmir, Ladakh, and Tibet.

Habits: Royle's Vole is fairly common at elevations above 10,000 feet (3,000 m) in Kumaon and Kulu, where it lives in open uplands and rocky ground covered with coarse grass. It is a rufous-brown animal, paler and yellowish on the sides, pale brown below, tail coloured like the back, ears projecting above fur.

The Bamboo Rats are strange creatures especially adapted to a subterranean life and look very much like gigantic moles. They belong to a separate family of rodents, the Rhizomyidae, and occur more or less in the same region where moles are found, namely, Nepal, Sikkim, Bhutan and Assam. Hence, we skip to the next family of rodents, the Hystricidae to which belongs the Indian porcupine.

<table>
<thead>
<tr>
<th>THE INDIAN PORCUPINE</th>
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<tbody>
<tr>
<td>Prater, p. 215,</td>
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<tr>
<td>Plate 47 facing p. 205</td>
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<td>Rodentia</td>
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<td>family</td>
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<td></td>
<td>Hystricidae</td>
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<td></td>
<td>genus and species</td>
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<tr>
<td></td>
<td>Hystrix indica Kerr</td>
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164
Size: Head and body, 28-35 in (70 - 90 cm); tail, 3 to 4 inches (8 to 10 cm), with its spines 7 to 8 inches (18 to 20 cm); weight 25 to 40 lb (11 to 18 kg).

Distinctive Characters: Porcupines are easily recognised by their hair, modified more or less completely into spines. Other rodents have spines, but never so long or formidable. They reach their highest development in the Indian Porcupine. Its neck and shoulders are crowned with a crest of bristles 6 to 12 inches (15 to 30 cm) long. The quills on the back are very profuse. Here the under-armature of short thick quills is more or less hidden by a bristling mantle of longer and thinner spines. Each quill is ornamented with deep brown or black and white rings. The white 'rattling quills' on the tail are large and well open, and attain their greatest development in this porcupine.

Distribution: The Himalayas to Cape Comorin.

Habits: The Indian Porcupine favours rocky hill-sides. It adapts itself to any type of country, moist or arid, and inhabits both open land and forest. In Kumaon and the western Himalayas, it is found at an altitude of 8,000 feet (2,400 m) and more. It shelters by day in caves, amongst rocks, or in a burrow dug by itself, or it uses and, if necessary, enlarges one dug by some other animal.

There are fantasies woven around this peculiar animal. The one popular story is that it shoots its quills. Hence we append Prater's note on its habitat and skill in using the quills. "When a burrow is dug, a great quantity of earth is thrown up at its mouth. The entrance is usually strewn with bones; porcupines gnaw these bones just as they gnaw the dropped horns of deer. Horn and bone contain calcium and lime which helps the growth of their quills. Besides the main entrance, there are usually two or three bolt holes or emergency exits near the mouth of the burrow. The entrance gallery runs deep into earth. A burrow ... had a gallery 60 feet (18 m) in length. It led to a chamber about 4 feet (120 cm) square and 18 inches (45 cm) high, lying some 5 feet (150 cm) or so below ground level. Porcupines come out after dark. They have a keen sense of smell and display high intelligence in evading traps. Vegetables of all kinds, grain, fruit, and roots are their main food. ... When irritated or alarmed, porcupines erect their spines, grunt and puff, and rattle their hollow tail quills. Their method of attack is peculiar. The animal launches itself backwards with incredible speed and, clashing its hind-quarters against an enemy, drives its erect quills deep into it with painful, or even fatal, results. ... a panther was slain by a porcupine, its head pierced by the thrusting quills. There is yet another record of an almost full-grown tiger meeting its death by leaping on a porcupine. Its lungs and liver were riddled with quills, and it could do little more than crawl away, to die a few yards from its victim. In its backward rush the real damage is done by the compact mass of short white quills, solid and strong, set above its hind quarters. If the object struck is large, the longer quills also take effect. They are more easily dislodged and are left embedded in the victim. The popular belief that porcupines 'shoot' their quills can be disregarded. Quills damaged in action or from other causes are replaced. A new quill grows up under the old one and dislodges it. Individuals may be quite fearless. There is a record of a porcupine attacking a panther at a drinking pool."

Formerly, rabbits and hares were lumped with rodents as the Duplicidenta in the order Rodentia. The lover of rabbits might consider this little odd. However, today, these animals are placed in the order Lagomorpha which comprises two families,
the Leporidae (rabbits and hares) and the Ochotonidae (mouse-hares). 'The true rabbits do not occur in India, but the closely related Assam Rabbit or Hispid Hare [Caprolagus hispidus (Pearson)] is found along the foot of the Himalayas from Uttar Pradesh to Assam.' True rabbits differ from hares in some respects: the former are born in burrows and are blind and nearly naked at the time of birth. They take two weeks' time to get up on their feet, and run and fend for themselves only after a month. Hares, on the other hand, are born not in burrows but in growing grass and at birth are well furred and have open eyes. Mouse-hares are found only in the Himalayas and are small, tailless animals.

**THE RUFOUTAILED HARE**

Prater, p. 219,
Plate 47 facing p. 205

Local Names: Hindi - khargosh;
Marathi - sasa.

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<tr>
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<tr>
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<td>Leporidae</td>
</tr>
<tr>
<td>genus and species</td>
<td>Lepus nigricollis ruficaudatus Geoffroy</td>
</tr>
</tbody>
</table>

Size: Head and body, 17 to 19 in (40 to 50 cm), weight, 4 to 5 lb (1.8 to 2.3 kg)

Distinctive Characters: The Rufoustailed Hare has a rufous-brown coat much mixed with black on back and face, breast and limbs rufous, chin, upper throat and lower parts white, upper surface of tail rufous-brown.

Distribution: The Rufoustailed Hare ranges from the Himalayas southwards to the Godavari River.

Habits: Where the country is suitable hares are numerous. Large tracts of bush and jungle alternating with cultivated plains afford them ideal conditions. They are less numerous in forests. They ascend the hills to some height. L. n. ruficaudatus is found in Kumaon at levels nearing 8,000 feet (2,400 m).

... They are nocturnal but not exclusively so. By day a hare usually makes itself comfortable in some patch of grass. ..., it scoops out a hollow. ... it settles down to sleep. ... They have many enemies, foxes, mongooses, wild cats, ... Lying still the hare is not easily detected and remains safe, unless stumbled upon. Then it bolts wildly or goes off at an easy canter, usually stopping at the end of its run to sit up and look around. A common refuge in flight is a fox hole or some such burrow.

**THE HIMALAYAN MOUSE-HARE**

Prater, p. 220,
Plate 47 facing p. 205

Local Names: Bhotia - gumchi pichi; Lepcha - cumchen.

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<tr>
<td>family</td>
<td>Ochotonidae</td>
</tr>
<tr>
<td>genus and species</td>
<td>Ochotona roylei (Ogilby)</td>
</tr>
</tbody>
</table>
Size: Head and body, 6 to 8 inches (15 to 20 cm)

Distinctive Characters: ... A mouse-hare is somewhat like a guinea-pig in build. It has a short muzzle, small rounded head, rounded ears, and no tail. The hair is exceedingly fine, straight, and glossy. Several species are found in the Himalayan region. The common species of the Himalayas is O. roylei. The typical form of this species, inhabiting Kumaon, has a reddish brown coat with a pale band over the nape. There is considerable seasonal change in colour in these animals.

Distribution: O. roylei ranges through the Himalayas from Kashmir to Moupin at elevation ranging usually from 11,000 to 14,000 feet (3,400 to 4,300 m).

Habits: Himalayan Mouse-Hares usually live on open rocky ground above the treeline. ... In open ground they make no burrows but live under rocks and piles of stones. In forest, they burrow under the roots of trees. In the higher Himalayas, mouse-hares are perhaps the most popular and fascinating animals. Their timid interest in the traveller is sometimes the only cheerful incident during long marches over the desolate boulder-strewn wastes. When approached, they seek immediate shelter in the piles of rocks. But soon one or more reappear to peep over the top of a rock, or sit motionless deciding whether the intruder is dangerous or not. Reassured, they re-commence their play racing over and around the rocks, springing from one projection to another, vanishing and as suddenly popping up in unexpected places. Their food must vary considerably with the season. They feed on coarse grasses. ... During winter their homes lie buried under many feet of snow. Whether they hibernate, or live on gathered stores of food is not exactly known.

So far we considered small herbivores: now we turn to large ones. The largest and grandest of all land mammals is the elephant — the 'Gajraj' of Sanskrit poets. It is a herbivorous animal and there is everything stately about it. In fact, it stands apart in a class by itself and is loved by children and adults alike.

Today, the elephants are found only in Africa and Asia. The African animal is bigger and has enormous ears with a trunk ending in 'two equal-sized lips'. The Asian one is a bit smaller and has a single 'lipped' trunk. They are placed in the order Proboscidae — a word based on the animal's trunk. The order consists of a single family, the Elephantidae which includes two living genera, 'Elephas the Asiatic elephant and Loxodonta the African elephant.' The Corbett National Park in Kumaon is one of the homes of elephants in India.

THE INDIAN ELEPHANT
Prater, p. 224,
Photo plate 43 facing p. 193
and photo plate 49 facing p. 209

Local Names: Sanskrit - hasti,
gaja; Hindi - hathi (male),
hathnī (female); Marathi - hatti.

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<td>genus</td>
<td>Elephas maximus</td>
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<tr>
<td>and species</td>
<td>Linnaeus or Elephas maximus indicus</td>
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<td></td>
<td>G. Cuvier</td>
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Size: The Indian Elephant rarely exceeds 10½ feet (3.20 m) at the shoulder. The average height of an adult male is 9 feet (2.75 m). The female is a foot (30 cm) lower. ... Few tusks weigh more than 100 lb (45.5 kg) the pair.

Distinctive Characters: Generally only the males have large tusks. The tusks of females scarcely protrude or perhaps protrude a few inches. The contour of the tusks varies. ... In some males the tusks are no longer than in females. ... these makhnas are very large in build, with extraordinarily well-developed trunks.

Distribution: The forest-clad portion of India, ...

Habits: Elephants chiefly frequent areas covered with tall forests where the ground is hilly or undulating, and where bamboos grow in profusion. They are extremely adaptable and will live in steamy humid jungle or in cool elevated forests. ... their tracks have been seen in the snow 12,000 feet (3,660 m) above sea-level. ... herds may vary from 5 to 60 or more animals.

A full-grown elephant will eat from 600 to 700 lb (270 to 320 kg) of green fodder a day.

Elephants have very poor sight; the sense of smell and hearing are highly developed, more so than in most animals.

Most of the other herbivores are divided into two broad groups: the odd-toed ungulates and the even-toed ungulates where the word ungulates means the hoofed animals. The first group comes under the natural order Perissodactyla and includes horses, rhinoceroses, and tapirs. The horse family is named the Equidae which represents horses, asses and zebras. Wild horses and zebras are not found in India. Wild asses occur in the desert zones of India and in the high open plateaux of Tibet and Ladakh. The latter is called the Tibetan Wild Ass [Equus hemionus kiang, Prater, p. 288]. The rhinoceros family is named the Rhinocerotidae and represents rhinos only. The Great Indian One-horned Rhinoceros [Rhinoceros unicornis Linnaeus, Prater, p. 229, photo plate 52 facing p. 220] lives in Nepal, West Bengal and Assam. It is all along the eastern foothills of the Himalayas, but is not found today in the western part. This leaves the even-toed hoofed animals.

The natural order Artiodactyla includes all even-toed ungulates. Under it come such diverse animals as oxen, sheep, goats, antelopes, deer, pigs, giraffes, camels and hippopotami. The largest family of the order Artiodactyla is the Bovidae which includes all oxen, sheep, and goats, and also the antelopes and gazelles. This family is further divided into several sub-families: the Antilopinae includes true antelopes and gazelles, the Boselaphinae the four-horned antelope and the Nilgai and the Rupicaprinae the goat-antelopes — serow, goral and takin. The other families of the order Artiodactyla are the Cervidae and the Suidae: the former represents the deer family and the latter the pig family.

Among the wild bovines of India are the massive animals like the Gaur [or the Indian Bison, Bos gaurus H. Smith, Prater, p. 243, plate 58 facing p. 242], the Banteng [or the Tsaine, Bos banteng Wagner, Prater, p. 244, plate 58 facing p. 242], the Yak and the Wild Buffalo [Bubalus bubalis (Linnaeus), Prater, p. 247, plate 58 facing p. 242 and photo plate 56 facing p. 240]. Today, the Banteng, which was formerly found in the state of Manipur, is perhaps extinct in India. The gaur is
an animal of the foothills in the Assam Himalayas and of the peninsular India. The wild buffalo lives in the grass jungles of the Nepal Terai, the plains of Ganga and Brahmaputra in Assam, and in some pockets in Madhya Pradesh and elsewhere in India. The yak is the only Himalayan animal which at times strays into Kumaon.

**THE YAK**
Prater, p. 246,
Plate 58 facing p. 242

Local Names: Hindi- ban chour;
Tibetan - dong, brong dong (wild), pegu (domesticated).

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</tr>
<tr>
<td>family</td>
<td>Bovidae</td>
</tr>
<tr>
<td>genus and species</td>
<td>Bos grunniens Linnaeus</td>
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</table>

**Size:** An adult bull Yak stands about 5½ feet (170 cm) at the shoulder and may reach about 6 feet (185 cm). A bull weighs about 1,200 lb (545 kg). Good horns measure 25 to 30 inches (65 to 75 cm).

**Distinctive Characters:** The wild Yak is a massively built animal with a drooping head, high humped shoulders, a straight back, and short sturdy limbs. Shaggy fringes of coarse hair hang from its flanks, cover chest, shoulder, thigh, and the lower half of the tail, and form a bushy tuft between its horns and a great mane upon its neck.

The Yak receives additional warmth through the rigorous winters from a dense under-coat of soft closely matted hair. In the spring the under-fur comes away in great masses, and, though completely separated from the skin, adheres in untidy scattered patches to the hairy body.

The colour of a wild Yak is a uniform blackish brown with a little white about the muzzle. The wild bull's horns are much more massive than those of any domestic Yak. ... Distinguishing between the wild and tame animals is sometimes less simple than is popularly believed.

**Distribution:** ... Within Indian limits proper, Yaks occur only in the Changchenmo Valley in Ladakh. They sometimes stray ... into some of the passes in east Kumaon.

**Habits:** An inhabitant of the coldest, wildest, and most desolate mountains, where both arctic and desert conditions prevail. The wild Yak's existence is one of continuous struggle against the adverse forces of its environment. It is one of the highest dwelling animals in the world. In summer time Yaks are found at elevations ranging from 14,000 to 20,000 feet (4,270 to 6,100 m) and even in winter they do not descend much below this level. They live in small herds, except during the spring when the newly sprouting grass attracts large assemblages. ... Winter is a time of great privation, when many die of starvation and exposure. ... Like other bovines Yaks love to ... wallow in ... icy streams ... The herd ... travels at a rapid pace. They are in their element in the snow, in which their usual way is to travel in single file, each animal carefully placing its feet in the imprints left by the hoofs of the one preceding it. As with most bovines smell is their acutest sense, sight and hearing are less keenly developed.
The four sheep which inhabit the Himalayan ranges are the Shapu or Urial, the Nayan or Great Tibetan Sheep, Marco Polo's Sheep and the Bharal or Blue Sheep. Of these, the first and the third might be found on the borders of India which exclude Garhwal and Kumaon. The Nayan and the Bharal too are not plentiful in Uttarakhando but their existence is not ruled out. Hence, we consider these animals here.

**THE NAYAN, or GREAT TIBETAN SHEEP**
Prater, p. 250, Plate 59 facing p. 243

Local Names: Ladakhi - nayan (male), nayanmo (female); Tibetan - nyang.

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<tbody>
<tr>
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</tr>
<tr>
<td>Family</td>
<td>Bovidae</td>
</tr>
<tr>
<td>Genus and Species</td>
<td>Ovis ammon hoddsoni Blyth</td>
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</tbody>
</table>

Size: This is the largest of all wild sheep, standing 3½ to 4 feet (110 to 120 cm) at the shoulder; horns, 36 to 40 inches (90 to 100 cm). The record horn measures 57 inches (144.8 cm).

Distinctive Characters: ... Long in the leg, graceful and light, the Nayan suggests an antelope build. The horns in the male never exceed a single circle, ... The ram is light brown, darker on the withers; its rump, the caudal disc surrounding the tail, throat, chest, belly, and the insides of the legs are white. Old rams develop a white ruff about the neck, much of which is shed in the summer coat. Females have little or no mane, the white of the undersides is less pure, and the caudal disc indistinct. The winter coat in both sexes is paler.

Distribution: The plateau of Tibet from northern Ladakh eastwards to the country north of Sikkim. In quest of grazing they occasionally cross ... into Kumaon ...

Habits: The Tibetan plateau, where Nayans live, presents a wilderness of desolate plains and low undulating sand hills, scorched in summer and swept by icy winds through the freezing winters. In this desert terrain the sheep are naturally migratory and wander to wherever food and water is to be got. In the spring, when melting snows cause the scantly herbage to sprout, Nayans frequent the borders of the snow-line or enter the ravines, some of which hold trickling streams whose banks are covered with low bushes and herbage. They summer in the higher levels above 15,000 feet (4,575 m), and in winter descend to the shelter of the lower valleys.

**THE BHARAL, or BLUE SHEEP**
Prater, p. 252, Plate 59 facing p. 243

Local Names: Hindi - bharal, bharar, bharut; Ladakhi - na snq; Nepali - nervati; Bhotia - nao, knao.

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<tbody>
<tr>
<td>Order</td>
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</tr>
<tr>
<td>Family</td>
<td>Bovidae</td>
</tr>
<tr>
<td>Genus and Species</td>
<td>Pseudois nayaur (Hodgson)</td>
</tr>
</tbody>
</table>
Size: 3 feet (90 cm) high at the shoulder; scaling 120 to 150 lb (55 to 70 kg). Horns average 23 to 24 inches (58 to 61 cm).

Distinctive Characters: In structure and habits the Bharal holds a place intermediate between sheep and goats. Its horns are rounded and smooth, and curve backwards over the neck. It has no face glands. ... In these characters the Bharal approaches the goats. But a Bharal ram is not bearded, nor has he that unpleasant 'goaty' odour.

The general colour of the head and upper parts is brownish grey, suffused with slaty blue, browner in summer and more distinctly slaty grey in winter. The colour in any season blends perfectly with the blue shale and rock of the open hill-sides where Bharal lives. The face and chest in old rams is black. A black stripe runs along the middle of each flank and down the front of the legs. All these black markings are absent in ewes. The horns are smooth and marked with fine striations, lines of growth. They curve outwards and downwards and in well-grown rams, curl backwards at the tips.

Distribution: Though typically a Tibetan animal, the Bharal is also found in Sikkim, Ladakh, and Nepal.

Habits: To find Bharal one must seek the higher altitudes, neighbouring on 16,000 feet (4,880 m) in summer and rarely below 12,000 (3,660 m) in winter. In the main Himalayan range they are found at levels between the tree- and snow-line, where there is rich and abundant grass. ... In habits, as in structure, Bharals are a mixture of goat and sheep. Like sheep they graze on open undulating grassy slopes, but like goats they climb well and do not hesitate to take to precipitous cliffs, ... They never enter forest or scrub.

In summer they live in flocks of 10 to 40 or 50 animals, but sometimes as many as 200 may assemble.

The wild goats of India number four viz. Ibex, Markhor, Himalayan and Nilgiri Tahr. Markhor is found in the Valley of Kashmir and in the mountain ranges west of it. The Nilgiri Tahr is an animal of South India and is not found in the Himalayas. Thus the two Himalayan goats in which we are interested here are Ibex and Himalayan Tahr.

### THE IBEX
Prater, p. 254,
Plate 60 facing p. 254

Local Names: Ladakhi - skin or sakin (male), dabmo or danmo (female); Kashmiri - kail; Kulu - tangrol.

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<td>Bovidae</td>
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<tr>
<td>genus and</td>
<td>Capra ibex Linnaeus</td>
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<tr>
<td>species</td>
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Size: Height of male at shoulder, 40 inches (100 cm); female, smaller. Good horns of males measure 40 to 45 inches (100 to 115 cm) around the curve. A male in good condition weighs about 200 lb (90 kg).
Distinctive Characters: A sturdy, thick-set goat, the male with a great beard and a coat of coarse brittle hairs. In winter, a dense under-fur of wool helps it to withstand the intense cold of its native mountains. The colour is variable. In general, the winter coat is yellowish white, more or less tinged with brown and grey. In summer, the general hue is dark brown with irregular white patches. The female is yellowish brown and insignificant to look at. The great scimitar-shaped horns of the buck are flat, and bossed with bold ridges in front.

Distribution: Mountain ranges ... from Afghanistan to Kumaon. ... The Himalayan Ibex inhabits the western Himalayas on both sides of the main Himalayan range.

Habits: The favourite grounds of Ibex lie in the higher elevations above the tree-line. In the spring they are found low below the snow-line, attracted by the new grass sprouting in patches on the steep slopes of the nullahs. They graze early in the morning and again in the evening. Above their grazing grounds Ibex have the shelter and security of precipitous cliffs and ridges.

Ibex lives in herds numbering from a dozen to 40 or 50 animals, but much larger assemblages are sometimes seen. ... They are hunted for their soft woolly under-fur. ... No wool is so rich, so soft, and so full.

THE HIMALAYAN TAHR
Prater, p. 258,
Plate 60 facing p. 254
Local Names: Western Himalayas - tehr, jehr; Kashmir - kras, jagla; Nepali - jhara.

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<td>Bovidae</td>
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<tr>
<td>genus and</td>
<td>Hemitragus jemlahicus</td>
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<tr>
<td>species</td>
<td>(H. Smith)</td>
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Size: Height of male at shoulder, 36 to 40 inches (90 to 100 cm); weight about 200 lb (90 kg). Horns 12 to 15 inches (30 to 40 cm); record, 16½ inches (41.9 cm) with a girth of 10 inches (25.4 cm). Females, smaller in build with horns seldom exceeding 10 inches.

Distinctive Characters: A wild goat with a finely formed head, narrow erect ears, a heavy body, and long, robust limbs. The hair on head and face is short. The body is covered with tangled masses of coarse, flowing hair. On the neck and shoulders it grows in a mane which sweeps down to the knees. The colouring is very variable. Generally it is a deep reddish brown, and there is a dark mid-dorsal streak, not always distinct. Old males are darker, particularly about the back and quarters. Ewes and young males are lighter brown; kids much paler.

The horns are short and close-set. They are stout at the base, keeled in front, and wrinkled except towards the tips. They curve backwards, and in old bucks continue downwards.

Distribution: Throughout the Himalayas from the Pir Panjal to Sikkim.

Habits: Of all wild goats, Tahr perhaps selects the most inaccessible ground to live in. Though never found above the tree-line, that is above 10,000 to 12,000 feet (3,050 to 3,660 m), their favourite habitat is a precipitous terrain of towering cliffs,
rocks, dense scrub, and forest. Ibex and markhor ascend equally difficult ground as nimbly when driven to, but the Tahr makes such terrain its natural home. ... Their love of shade and shelter gives them further protection. Females frequently come out to graze in open clearings, but not the old males. They bury themselves in the forests of oak and ringal and cane. ... they emerge only in the evening ... Like all true goats, Tahr lives in herds.

India has beautiful antelopes and gazelles. The former are very elegant animals, even then the latter are small and slender and look much more graceful. The Indian antelope is the Blackbuck (Prater, p. 270, plate 62 facing p. 272) and the Indian gazelle is the Chinkara (Prater, p. 268, plate 62 facing p. 272). They belong to the sub-family Antilopinae and are not the Himalayan animals. In the Himalayas — not the Indian side of it, but in the Tibetan highland — exist the Tibetan antelope, the Chiru (Prater, p. 267, plate 61 facing p. 255) and one gazelle (Prater, p. 269) which belong to the sub-family, the Pantholopinae and are outside our purview. The Boselaphinae, a sub-family of the Bovidae, which does not represent true antelopes, has the Four-horned Antelope (Chowsingha, Prater, p. 271, plate 62 facing p. 272) and the Nilgai (Blue Bull, Prater, p. 272, plate 62 facing p. 272) which too are not the Himalayan animals. The Himalayan animals are Serow and Goral which are neither goats nor antelopes but hold an intermediate position and are called 'goat-antelopes' and are placed in the sub-family, the Rupicaprinae. They have distinctive conical horns which curve backwards and do not have the terminal hook.

THE SEROW
Prater, p. 262,
Plate 61 facing p. 255

Local Names : NW Himalayas
- sarao; Kashmiri - ramu,
halj, salabhir; Sikkim - gya.

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<tr>
<td>Family</td>
<td>Bovidae (Rupicaprinae)</td>
</tr>
<tr>
<td>Genus and</td>
<td>Capricornis sumatraensis</td>
</tr>
<tr>
<td>Species</td>
<td>(Bechstein)</td>
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Size : Old males, 39 to 42 inches (100 to 110 cm) at the shoulder; weight, over 200 lb (90 kg); horns, 9 to 10 inches (23 to 25 cm) in length, 5 to 6 inches (13 to 15 cm) in girth.

Distinctive Characters : With its large head, donkey-like ears, thick neck, and short limbs the Serow is an ungainly creature. Its habit of standing with its forelegs astraddle, the hoofs widely splayed and its head thrust downward, adds to its awkward appearance. Both sexes are similar in build.

The coat is coarse and rather thin in Serow which lives at lower elevations; its colour varies so much that it is difficult to describe. It ranges from grizzled black or blackish grey-roan to red. ... In the Himalayan races the limbs are chestnut above and dirty white below.

Distribution : The Himalayas from Kashmir ... to Assam.

Habits : In the Himalayas Serow favours an elevation between 6,000 to 10,000 feet (1,850 to 3,050 m).
Serow lives in the recesses of thickly-wooded gorges whose boulder-strewn slopes and shallow caves give shelter from the weather. In the mornings and evenings they come out to feed on the rank herbage of the more open slopes. They are more or less solitary creatures, though four or five may be seen feeding on the same hill. Their movements belie their awkward appearance. They are exceedingly active animals, not only on rock but also on flat ground. When disturbed, Serow dashes away with a hissing snort. Their call is a whistling scream.

**THE GORAL**
Prater, p. 263,
Plate 61 facing p. 255, and photo plate 57 facing p. 241
Local Names: NW Himalayas - goral; Kashmiri - pij, pijur, rai, rom.

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<tr>
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<tr>
<td>genus and species</td>
<td>Nemorhaedus goral (Hardwicke)</td>
</tr>
</tbody>
</table>

**Size:** Height at shoulder, 26 to 28 inches (65 to 70 cm); weight, 58 to 63 lb (25 to 30 kg); horns, about 5 inches (13 cm).

**Distinctive Characters:** A stocky goat-like animal. Hair coarse, forming a small crest on the neck.

The general colour of the Grey Goral [Nemorhaedus goral goral (Hardwicke)] is a yellowish grey suffused with black. Individuals differ, ... The chin, upper lip, underside of the jaws, and throat patch are white.

Goral has short insignificant horns. They diverge slightly, curve backwards, and are marked with rings or ridges for the greater part of their length.

**Distribution:** Grey Goral, western to eastern Himalayas.

**Habits:** In the Himalayas, Goral favours an elevation of 3,000 to 9,000 feet (900 to 2,750 m); though they may ascend to and have been observed at 13,000 to 14,000 feet (3,950 to 4,250 m). ... This is one of the best known of Himalayan animals, frequently seen near hill-stations. Where one is seen others are not far off. They usually associate in small parties of four to eight feeding on rugged grassy hill-sides, or rocky ground in forest, usually in the mornings and evenings, and in cloudy weather at all hours. The loud 'hiss' given when one is alarmed is repeated by the others.

Deer which in outer appearances resemble antelopes and gazelles form a separate family, the Cervidae of the order Artiodactyla. They differ in some respects from the other bovines but the main difference is in the character of the horns. Deer have horns of solid bones whereas all bovines have hollow horns. Deer shed and regrow their antlers periodically whereas all bovines retain their horns permanently. Antlers give their possessors, magnificence.

The seven types of deer which we mention here are not necessarily Himalayan animals: some of them occur elsewhere too. The Kashmir Stag [Hangul, Cervus elaphus hanglu Wagner, Prater, p. 286, plate 63 facing p. 273] is chiefly a Kashmiri animal. The Swamp Deer [Barasingha, Cervus duvauceli duvauceli Cuvier, Prater, p. 289, plate 63 facing p. 273 and photo plate 64 facing p. 278] are found in the
Terai region of the state of Uttar Pradesh but it is not clear whether they are in Uttarakhand also. The common Indian deer, the Sambar, is found in many parts of India and is frequently mentioned by Corbett in his jungle books on Kumaon. The Hog-Deer and its cousin the Chital are the pride of the Corbett National Park. The Muntjac is also found there. And finally there remain the Musk Deer which are very rare now but are well-known over the world for musk. We consider five of these animals here.

THE SAMBAR
Prater, p. 290,
Plate 63 facing p. 273 and plate 65 facing p. 279
Local Names : Hindi - sambar, samar; Marathi - sambar.

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<thead>
<tr>
<th>class</th>
<th>Mammalia</th>
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<tbody>
<tr>
<td>order</td>
<td>Artiodactyla</td>
</tr>
<tr>
<td>family</td>
<td>Cervidae</td>
</tr>
<tr>
<td>genus and species</td>
<td>Cervus unicolor Kerr</td>
</tr>
</tbody>
</table>

Size : The Sambar is the largest Indian deer and carries the grandest horns; height at shoulder nearly 5 feet (150 cm), average 55 inches (140 cm). A full-grown stag scales from 500 to over 700 lb (225 to over 320 kg).

Distinctive Characters : ... The coat is coarse and shaggy. In stags it forms a mane about the neck and throat. In the hot weather much of the hair is shed. The general colour is brown with a yellowish or greyish tinge. The underparts are paler. Females are lighter in tone. Old stags tend to become very dark, almost black. The antlers are stout and rugged. The brow tine is set at an acute angle with the beam. At its summit, the beam forks into two nearly equal tines. In some heads the outer, in others the inner tine is longer. The full number of points are developed in the fourth year.

Distribution : ... The Indian race Cervus unicolor niger is confined to the wooded districts of India.

Habits : Forested hill-sides, ... are the favourite haunt of the Sambar. Their food consists of grass, leaves, and various kinds of wild fruit. They feed mainly at night and retire into heavy cover at daybreak and do not usually come out till dusk. Their powers of sight are moderate, their scent and hearing acute. The capacity of so heavy an animal to move silently through dense jungle is amazing. Sambars take to water readily and swim with the body submerged, only the face and the antlers showing above the surface. ... Sambars are rarely found associating in large numbers. Four or five to a dozen are what one usually sees.

THE HOG-DEER
Prater, p. 291,
Plate 68 facing p. 288
Local Names : Hindi, Sindhi, and Punjabi - para.

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<tr>
<td>family</td>
<td>Cervidae</td>
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<tr>
<td>genus and species</td>
<td>Axis porcinus (Zimmermann)</td>
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</table>
Size: The height at the shoulder is 24 inches (61 cm), average horns measure 12 to 15 inches (30 to 38 cm).

Distinctive Characters: The name Hog-Deer has probably been suggested by the squat pig-like appearance of this animal and by its hog-like movements. When running it keeps its head low down, and moves without that bounding action so characteristic in deer.

The Hog-Deer is a relative of the chital and interbreeding between the two species is known to take place. ... is smaller and stouter in build. The body is long and the legs relatively short. The fur is brown, dark brown in the old stags, with a yellowish or reddish tinge. The white tips to the individual hairs give the coat a speckly appearance. The underparts of the body are paler and the inside of the ears and the underside of the tail are white. The young are spotted. Some young stags and hinds show these spots, particularly in summer though they are not always discernible. The summer coat is generally paler.

The small antlers are set upon very long bony pedicels. After giving out a short brow tine the beam is almost straight till it divides into a longer fore and shorter hind tine.

Distribution: The low alluvial grass plains of north India.

Habits: Hog-deer favour grass jungles by the banks of rivers, grass-covered delta islands, or open grass plains; always where the grass is not too high. ... Hog-Deer are generally solitary creatures. A pair will continue to frequent a particular stretch of grassland. Sometimes small parties up to 18 or so may be found grazing together. ... They are wary creatures; their sense of sight, smell, and hearing is acute. Persecution has made them almost nocturnal in many parts of their range.

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THE CHITAL or SPOTTED DEER

Prater, p. 292,
Plate 63 facing p. 273

Local Names: Hindi - chital, chitra, jhank; Marathi - chital.

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<tr>
<td>family</td>
<td>Cervidae</td>
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<tr>
<td>genus and</td>
<td>Axis axis (Erxleben)</td>
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<td>species</td>
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</table>

Size: The Spotted Deer is at its best in the Himalayan foothills, in the jungles of the Terai, and in Madhya Pradesh. A well-built stag from these parts stands 36 inches (90 cm) at the shoulder and weighs about 190 lb (85 kg).

The record head measures 39½ in (101 cm). A 34 inches (85 cm) antler would be good anywhere.

Distinctive Characters: The Chital is perhaps the most beautiful of all deer. Its coat is a bright rufous-fawn profusely spotted with white at all ages and in all seasons. Old bucks are more brownish in colour and darker. The lower series of spots on the flanks are arranged in longitudinal rows and suggest broken linear markings.
The graceful antlers have three tines, a long brow tine set nearly at right angles to the beam and two branch tines at the top. The outer tine, the continuation of the beam, is always longer. It may be noted that old bucks often have one or more false points on the brow antler where it joins the main beam.

**Distribution:** In India Chital is found in the forests at the base of the Himalayas and practically throughout the Peninsula ..., wherever there is jungle combined with good grazing and a plentiful supply of water.

**Habits:** One always associates Chital with beautiful scenery, with grassy forest glades and shaded streams. They are seen in herds of 10 to 30, which may contain 2 or 3 stags; but assemblages numbering several hundreds have been met with. They ... frequently associate with many forest animals, particularly with monkeys. They are less nocturnal than sambar and feed till late in the morning and again in the afternoon, and lie down in the interval in some shaded spot.

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**THE MUNTJAC or BARKING DEER**

Prater, p. 294,
Plate 68 facing p. 288 and photo plate 66 facing p. 282

Local Names: Hindi - karkar; Marathi - bhekad; English - Ribfaced Deer.

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<tr>
<td>family</td>
<td>Cervidae</td>
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<tr>
<td>genus and species</td>
<td>Muntiacus muntjak (Zimmermann)</td>
</tr>
</tbody>
</table>

**Size:** Height at the shoulder of an adult male is from 20 to 30 inches (50 to 75 cm); weight about 48 to 50 lb (22 to 23 kg). Excluding the pedicel, which may be up to 3 or 4 inches (8 to 10 cm) long, the horn rarely exceeds 5 inches (13 cm).

**Distinctive Characters:** The antlers are small, consisting of a short brow-tine and an unbranched beam. They are set on bony hair-covered pedicels which extend down each side of the face as bony ridges, hence the name Ribfaced Deer. In does, tufts of bristly hair replace the horns. Old males are browner in colour.

**Distribution:** ... The Muntjac of north India is Muntiacus muntjak vaginalis. ... The coat of the north Indian race is bright chestnut.

**Habits:** The haunts of the Muntjac are thickly wooded hills. In the Himalayas ... it occurs up to levels of 5,000 to 8,000 feet (1,500 to 2,450 m), sometimes even higher. They are seen singly or in pairs or in small family parties. Muntjac's keep to more or less thick jungles and come out to graze in the out-skirts of forest or in open clearings. They are fairly diurnal in habit. The food consists of various leaves and grasses and wild fruits. The call from a distance sounds much like the bark of a dog. It is given out at intervals, usually in the mornings and evenings, sometimes after nightfall.
THE MUSK DEER
Prater, p. 295, Plate 68 facing p. 288
Local Names : Hindi - kastura, mushk; Kashmiri - raos, rons.

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<tbody>
<tr>
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<tr>
<td>family</td>
<td>Cervidae</td>
</tr>
<tr>
<td>genus and species</td>
<td>Moschus moschiferus Linnaeus</td>
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</table>

Size : A little creature not more than 20 inches (50 cm) high at the shoulder, slightly higher at the croup.

Distinctive Characters : The Musk Deer holds a place between the deer and the antelopes. It is regarded as an undeveloped form of deer which has not progressed with the rest of its family. It is hornless ... In some ways it has taken a special line of development of its own. This is seen in its possession of a ... musk gland. The tail of a Musk Deer is peculiar. It is completely buried in the long hairs of the anal region and is for the most part naked except for a large tuft at the tip and a tuft at the base which covers its upper surface and sides. ... The musk gland is situated beneath the skin of the abdomen of the males. When fresh, its secretion has an unpleasant, pungent, urinary odour; when dry it acquires the scent of musk.

The Musk Deer wears a coat of thick and bristly hair, almost pithy in structure. The general colour is a shade of rich dark brown speckled with grey.

Distribution : ... The typical form ... is found in Kashmir, Nepal, and Sikkim.

Habits : Musk Deer live singly or in pairs and are generally met with in birch forest above the zone of the pines; at times they come down to lower levels, but always keep in thick cover. They scrape out a shallow form in which they lie concealed and come out to feed in the mornings and evenings.

The food consists of grass, lichens, leaves, and flowers.

The last animal we consider in the order Artiodactyla is Pig. It comes under the family Suidae and is found all over India. Hence, it is not an exclusively Himalayan animal but likely to occur in the forests of Uttarakhand, specifically in the foothills. The animal is known as The Indian Wild Boar [Sus scrofa Linnaeus, Prater, p. 299, plate 68 facing p. 288] and is variously called as suar, barba, bad janwar, bura janwar in Hindi. In Marathi it is ran-dukkar. Another specifically Himalayan specimen is the Pygmy Hog [Sus salvanius (Hodgson), Prater, p. 300] 'which is scarcely 10 inches (25 cm) high and inhabits the forests at the base of the Himalayas in Sikkim, Nepal, Bhutan, and Assam. Its habits are similar to those of the Wild Boar. It is said to live in herds of 5 to 20. It is nocturnal and rarely seen.'

Reptiles

The class of animals called the Reptilia consists of creatures like lizards, snakes, amphibians — crocodiles and tortoises. These reptiles do not walk on earth but crawl on it. They have many features in common.

The reptiles are much more in number than the mammals and I do not know whether there exists a systematic survey of them for the Himalayas. In the circumstance we confine to a few species. We begin with a big reptile or an amphibian which is quite common in the river Ramganga that flows through the Corbett National Park.

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The Gharial is a long, slender-snouted crocodile living in the rivers Indus, Ganges and Brahmaputra and in a few other rivers of this same region.

The Indian Gharial can grow to 20 feet in length. The eyes are set well up on the head and the nostrils are at tip of the long slender snout. The jaws are armed with small sharp teeth of nearly uniform size. The upper surface of the neck and the back have an armour of bony plates. The legs are longer proportionately than in most other crocodiles, and toes, especially those of the hindfeet are webbed.

A 'gharial' is not a true crocodile but a 'mugger' is. The latter belongs to the family Crocodylidae and is found all over India in ponds, lakes and rivers. I have seen dozens of crocodiles in the Ajwa lake near Baroda. Also, it is known to occur in the Tulsi lake near Bombay. By this token it might turn up anywhere in Uttarakhand too and for that reason I include it here.

The Gharial due to its long snout is a longer reptile than the Mugger, however, the latter is no small animal. In fact, the Mugger is just as powerful an animal as any Gharial and its jaws and tail are really fearsome.

The river Ramganga contains one more common reptile. This is a turtle. It is mistakenly called the river tortoise. Actually, tortoises are land animals whereas, turtles are aquatic ones and prefer to live in water. The latter come out of water on the river banks and bask in the sun. The Ramganga turtles come very big and have drawn the attention of many a visitor.

This is a soft-shelled turtle of Ganga and is found all over its tributaries.
Snakes like lizards, turtles and crocodiles form one large group of reptiles. There are some 400 species of snakes in India. Of these, perhaps 80 are poisonous and include cobras, kraits, corals and vipers. Which of these 400 species would turn up in Uttarakhand I cannot tell because there exists no such survey. However, there are some general rules which could serve as a guide. The tropics house most of the 2,700 species of the world snakes. The temperate zone has much fewer and the arctic zone has a lone species called the European Viper. Curiously, Iceland, Ireland and Antarctica have no snakes. In the Himalayas, the climatic condition of tropics to arctic is telescoped altitudewise in just 30,000 feet. Hence, one would expect that there are no snakes above 18,000 feet. Between 18,000 and 8,000 feet there would be fewer snakes. Below 8,000 feet the number of snakes would increase and these would be common with those of the plains. With these premises in mind we describe a few species of snakes which are likely to be met in Uttarakhand.

THE INDIAN COBRA or NAG

<table>
<thead>
<tr>
<th>class</th>
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<tbody>
<tr>
<td>order</td>
<td>Squamata</td>
</tr>
<tr>
<td>suborder</td>
<td>Serpentes</td>
</tr>
<tr>
<td>family</td>
<td>Elapidae</td>
</tr>
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<td>genus and</td>
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</tr>
<tr>
<td>species</td>
<td>Naja naja</td>
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</table>

This is a common poisonous snake of India. It is recognized by its hood. Its deadly venom affects the nervous system in contrast to viper’s poison which affects the blood vessels and causes the clotting of blood.

THE KING COBRA
or HAMADRYAD
or RANJNAG

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<tr>
<th>class</th>
<th>Reptilia</th>
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<tbody>
<tr>
<td>order</td>
<td>Squamata</td>
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<tr>
<td>suborder</td>
<td>Serpentes</td>
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<tr>
<td>family</td>
<td>Elapidae</td>
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<tr>
<td>genus and</td>
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</tr>
<tr>
<td>species</td>
<td>Naja elaps</td>
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</table>

The King Cobra is perhaps the most poisonous snake of India. It grows to more than 18 feet and perhaps is the longest, though not the heaviest, of all poisonous snakes. Its venom like those of all cobras affects the nervous system and is potent to kill an elephant.
THE INDIAN PYTHON

- **class**: Reptilia
- **order**: Squamata
- **suborder**: Serpentes
- **family**: Pythonidae
- **genus and species**: Python molurus

Pythons are non-poisonous snakes. They are heavy and long. They catch their prey by coiling round it and kill it by constriction.

THE HIMALAYAN PIT VIPER

- **class**: Reptilia
- **order**: Squamata
- **suborder**: Serpentes
- **family**: Crotalidae
- **genus and species**: Ancistrodon himalayanus

Pit vipers are not true vipers. They are so called because they have a deep pit on each side of the head between the eye and the nostril. The snake is undoubtedly poisonous but its venom is not potent enough to kill a man. It occurs between 7,000 and 16,000 feet in the Himalayas.

THE INDIAN EGG-EATING SNAKE

- **class**: Reptilia
- **order**: Squamata
- **suborder**: Serpentes
- **family**: Colubridae
- **genus and species**: Elachistodon westermanni

This is a rare species of snake which is found along the foothills of the Himalayas from Kumaon east to Arunachal Pradesh.
Birds

Birds have evolved through reptiles. This is rather strange. Reptiles are cold-blooded, crawling, fearsome creatures; birds are warm-blooded, sky-soaring, handsome aves. What a contrast! But in the scheme of nature this is true. Salim Ali writes: '... birds may reasonably be considered to be extremely modified reptiles, and according to the widely accepted classification of the great scientist T. H. Huxley, the two classes together form the division of vertebrates termed Sauropsida.' Today, birds are placed in their own class the Aves.

Birds fly; men walk. Year after year birds cross continents and oceans, yet, most men cannot do so in spite of best of aeroplanes. Men envy birds though they love them because birds brighten their lives. The proof of this lies in the societies of bird-watchers all over the world. And, to these beautiful creatures we now turn to. Our sources of information are Salim Ali's books: (i) Book of Indian Birds and (ii) Indian Hill Birds. The first we refer to as 'Salim Ali IB' and to the second as 'Salim Ali HB'. Whenever this reference is not given along with a species it means that it is the same as in the preceding case. We will follow the recent scientific classification.

In 'Indian Hill Birds' Salim Ali has listed more than 200 birds which nest in and around Mussoorie, Chakrata, Naini Tal, Ranikhet, Almora and the Siwalik ranges. This number by itself is large and would deter us from describing them fully. What we could attempt is a listing of them with proper remarks.

<table>
<thead>
<tr>
<th>THE VULTURES</th>
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<td>order</td>
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<td>family</td>
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genera and species:
1. THE HIMALAYAN GRIFFON VULTURE
   Gyps himalayensis Hume
   Salim Ali HB p. 159, photo-plate 72 facing p. 149
   Remark: This is practically the largest bird in the Himalayas.
2. THE INDIAN GRIFFON VULTURE
   Gyps fulvus
3. THE WHITE-BACKED VULTURE
   Pseudogyps bengalensis
4. THE LONG-BILLED VULTURE
   Gyps indicus

The Lämmergeier or Bearded Vulture is a famous bird of the Himalayas. It is a very large bird and its wing span (about 9 feet from tip to tip) exceeds that of the Himalayan Griffon Vulture. Its slender build 'without the disgusting naked neck' makes its general appearance more noble than any vulture's. It is midway between the eagles and the true vultures. Thus it finds its place here after vultures and before eagles.
genera and species:

1. **THE LAMMERGEIER or BEARDED VULTURE**
   Gypaetus barbatus Linnaeus
   Salim Ali HB p. 160
   Remark: This majestic bird, commonly called 'Golden Eagle' is quite abundant in the Himalayas. The race Hemachalanus was observed between 24,000 and 25,000 feet by the members of one of the Everest Expeditions.

2. **THE WHITE SCAVENGER VULTURE**
   Neophron percnopterus
   Salim Ali HB p. 161
   Remark: A much smaller bird than the one above.

The falcons and eagles belong to the same family and we give here falcons precedence over eagles.

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**THE FALCONS**

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<tr>
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<tr>
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<tr>
<td>family</td>
<td>Falconidae</td>
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</table>

genera and species:

1. **THE SHAHIN FALCON**
   Falco peregrinus peregrinator Sundevall
   Salim Ali HB p. 162, plate 54 facing p. 109

2. **THE CENTRAL ASIAN HOBBY**
   Falco subbuteo centralasiae

3. **THE INDIAN HOBBY**
   Falco severus rufipedoides
   Salim Ali HB p. 163

4. **THE KESTREL**
   Falco tinnunculus
   Remark: All these birds have one thing in common: they are remarkable for their aerobatics.

The Himalayan eagles are really large birds. For its noble bearings it is known as the regal bird of the Himalayas.
THE EAGLES

class Aves
order Falconiformes
family Falconidae

genera and species:

1. **THE HIMALAYAN GOLDEN EAGLE**
   *Aquila chrysaetos hodgsoni* Ticehurst
   Salim Ali HB p. 164, plate 55 facing p. 116
   Remark: This graceful bird's aerobatics are falcon-like and it dwells in rugged
   mountainous countryside. 'It is resident from about snow-line down to 7,000 feet
   or so, and seldom found lower, even in winter.'

2. **THE IMPERIAL EAGLE**
   *Aquila heliaca*

3. **THE BLACK EAGLE**
   *Ictinaetus malayensis* Temm. and Laug.
   Salim Ali HB p. 166, plate 56 between pages 116-117

4. **THE CRESTED HAWK-EAGLE**
   *Spizaetus cirrhatus*

5. **HODGSON'S HAWK-EAGLE**
   *Spizaetus nipalensis nipalensis*

6. **BONELLI'S HAWK-EAGLE**
   *Hieraaetus fasciatus*
   Salim Ali HB p. 167

   Falcons and Eagles prey upon pheasants and partridges. The latter ones are
   the most beautiful birds of the Himalayas. Monal (the pheasant) and Chukor (the
   partridge) belong to this group.

THE PHEASANTS

class Aves
order Galliformes
family Phasianidae

genera and species:

1. **THE WHITE-CRESTED KALEEJ PHEASANT**
   *Gennaeus hamiltoni* Griffith and Pidgeon
   Salim Ali HB p. 175, plate 62 facing p. 125

2. **THE KOKLAS PHEASANT**
   *Ceriornis macrolophus*
   Remark: The bird gets its name from a loud, ringing, kok-kok-kok... kokras (or pukras).
3. THE CHEER PHEASANT
   Catreus wallichii
   Salim Ali HB p. 176
   Remark: The birds sail like the Common Babbler 'which is a passable miniature of it.' The call chir-a-pir, chir-a-pir, chir, chir, chirwa, chirwa ... gives the bird its name.

4. THE MONAL or IMPEYAN PHEASANT
   Lophophorus impejanus
   Remark: This pheasant is reputed to be the most beautiful bird of the Himalayas and is taken note of by many travellers. However, it does not enjoy the same reputation among the ornithologists. Salim Ali's remark is: 'It is a large, dumpy bird, rather ungainly for a pheasant.' A sketch of it is also not found in his 'Hill Birds'.

THE PARTRIDGES

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<tr>
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<td>Phasianidae</td>
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genera and species:

1. THE COMMON HILL-PARTRIDGE
   Arborophila torqueola Valenciennes
   Salim Ali HB p. 179

2. THE RUFIOUS-THROATED HILL-PARTRIDGE
   Arborophila rufogularis
   Remark: This beautiful partridge prefers broad-leafed dense forest to conifers and is found between 5,000 and 10,000 feet.

3. THE CHUKOR
   Alectoris graeca Meisner
   Salim Ali HB p. 180, plate 64 between pages 132-133
   Remark: This conspicuous bird is quite colourful and has made a name for itself like Monal. It is found on high open hillsides and its call is kak-kak-kak, kawak-kak, kawak-kak, kawak-kak ... In winter it comes down to 4,000 or 5,000 feet but in summer goes up to 15,000 or 16,000 feet.

4. THE HIMALAYAN SNOWCOCK
   Tetraogallus himalayensis
   Remark: A bird of high Himalayas, it is mainly found in alpine pastures and rocky hillsides between 9,000 and 18,000 feet.

THE WOODCOCK

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<tr>
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<td>Charadriidae</td>
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genera and species:

1. **THE WOODCOCK**
   Scolopax rusticola Linnaeus
   Salim Ali HB p. 182
   Remark: It is a crepuscular and nocturnal bird of mixed forest and is seen between 8,000 and 12,000 feet.

   The pigeons and doves are gamebirds like pheasants and partridges and are placed next.

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<tr>
<th>THE PIGEONS</th>
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<td>Columbidae</td>
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genera and species:

1. **THE KOKLA or WEDGE-TAILED GREEN PIGEON**
   Sphenocercus sphenurus Gould
   Salim Ali HB p. 168, plate 57 between pages 116-117
   Remark: A fruit-eating bird, it essentially belongs to broad-leafed Himalayan forest and is seen around hill stations only in summer. A flock of 15 or more birds is rare. Its call Ko-kla-koi-oi-oi, oilli, illio-kla, ... is melodious and its name is derived from it.

2. **THE PIN-TAILED GREEN PIGEON**
   Sphenocercus apicaudatus
   Remark: A bird similar to the one above, it differs in its pin shaped tail.

3. **THE WHITE-BELLIED or SNOW-PIGEON**
   Columba leuconota Vigors
   Salim Ali HB p. 172, plate 60 between pages 124-125
   Remark: It looks much like a domestic pigeon; however, it is a bird of high Himalayas and does not descend to 5,000 feet even in winter. It is mostly found between 10,000 and 14,000 feet in summer.

4. **THE BLUE ROCK-PIGEON**
   Columba livia
   Remark: This is a well-known pigeon which is found up to about 5,000 feet in the Himalayas.

5. **THE TURKESTAN ROCK-PIGEON**
   Columba rupestris
   Salim Ali HB p. 173
   Remark: As the name indicates it 'is really a bird of beyond our northern limits ... but it occurs on our fringe ... between 11,000 and 15,000 feet.'
THE DOVES

class Aves
order Columbiformes
family Columbidae

genera and species:

1. THE EMERALD or BRONZE-WINGED DOVE
   Chalcophas indica Linnaeus
   Salim Ali HB p. 171, plate 59 facing p. 124
   Remark: This little dove prefers well-wooded country and seldom ascends to over
   5,000 feet.

2. THE RUFIOUS TURTLE-DOVE
   Streptopelia orientalis Latham
   Salim Ali HB p. 174, plate 61 between pages 124-125
   Remark: This bird is found all over India except in our desert. In summer, it is
   quite common around well-wooded hill stations and is found up to about 12,000 feet
   in the Himalayas. Its call is goor ... gur-gurgroo ...

The parrots and parakeets are not gamebirds still they are trapped, caught
and caged for the silly amusement of bird-keepers. We give them here a place of
honour.

THE PARAKEETS

class Aves
order Psittaciformes
family Psittacidae

genera and species:

1. THE SLATY-HEADED PARAKEET
   Psittacula himalayana Lesson
   Salim Ali HB p. 145

2. THE BLOSSOM-HEADED PARAKEET
   Psittacula cyanocephala
   Remark: These two parakeets fly in small flocks and are found in well-wooded
   forests. They eat the cones of Chir pine. Their nests are found all over the Himalayas
   up to about 7,000 feet.

The Cuckoos have earned for themselves a bad name — the Brainfever Bird —
from the Britishers because they cannot keep quiet during the hot-season. Anyway,
their feverish call has found favour with the Indian poets who have immortalized
them as 'papiha' in their numerous poems. In this they are lucky because the Indian
poets have ignored their 'parasitic' habit of getting their brood stealthily fostered
by other birds. Science is impartial. It uses their calls to tell apart similar birds.
THE CUCKOOS

genera and species:

1. THE CUCKOO
   Cuculus canorus Linnaeus
   Salim Ali HB p. 143

2. THE INDIAN CUCKOO
   Cuculus micropterus
   Call: Orange-pekoe

3. THE HIMALAYAN CUCKOO
   Cuculus optatus
   Call: hook ... po-po-po

4. THE SMALL CUCKOO
   Cuculus poliocephalus
   Call: The bird has an unmusical wild screaming note.

5. THE LARGE HAWK-CUCKOO
   Hierococcyx sparverioides

6. THE COMMON HAWK-CUCKOO or BRAIN-FEVER BIRD
   Hierococcyx varius (HB p. 143)
   Cuculus varius Vahl (IB p. 50)
   Call: Hindi pee-kahan?
   Marathi paos-ala

The owls are birds of ill-omen. This is how Indians look at them. What an ignorance! These birds are there to eat rats and mice and help men. This benevolence is paid back by ingratitude. We redress this injustice by listing them here.

THE OWLS

genera and species:

1. THE FOREST EAGLE-OWL
   Huhua nipalensis Hodgson
   Salim Ali HB p. 154, plate 52 between pages 108-109
2. THE HIMALAYAN WOOD-OWL
Strix nivicola
Salim Ali HB p. 155
Call: mellow twit ... too-hoo
Remark: These owls prefer deep forests and are found between 4,000 and 11,000 feet.

3. THE SPOTTED SCOPS OWL
Otus spilocephalus Blyth
Salim Ali HB p. 156, plate 53 between pages 108-109
Call: phew ... phew
Remark: This owl lives in oak, pine and deodar forests between 4,000 and 7,000 feet elevation.

4. THE COLLARED SCOPS OWL
Otis bakkamoena
Remark: In the Himalayas, it occurs on hills up to 7,000 or 8,000 feet.

5. THE HIMALAYAN BARRED OWLET
Glaucidium cuculoides Vigors
Remark: A resident of oak and horse-chestnut forest, it is found at an elevation of 7,000 feet in the Himalayas.

6. THE COLLARED PIGMY OWLET
Glaucidium brodiei
Call: It is pleasant and whistling Toot ... toot-toot ... toot and 'is a familiar sound at most Himalayan hill-stations.'

The Owls and the Nightjars are a little alike and hence the latter follow in the order.

THE NIGHTJARS

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genera and species:

1. THE LONG-TAILED NIGHTJAR
Caprimulgus macrourus Horsfield
Salim Ali HB p. 153, plate 51 facing p. 108
Remark: It is a purely crepuscular and nocturnal bird found in shady hill-forest up to 8,000 feet. Its call is a very loud and resonant chawnk which comes close to the sound of felling a tree.

2. FRANKLIN'S NIGHTJAR
Caprimulgus monticolus
Call: a loud penetrating sweesh or chweep like a whip-lash cutting the air
Remark: The bird is found up to about 6,000 feet in the Himalayas.
The Swifts are great fliers and some of them attain a speed of 150 miles per hour. This makes them difficult to study: 'Its phenomenal speed on the wing enables it to cover such vast distances in the course of its daily round of feeding that the true significance of its sporadic appearances and disappearances is not easy to interpret.'

**THE SWIFTS**

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</table>

**genera and species:**

1. **THE ALPINE SWIFT**
   Apus melba Linnaeus
   Salim Ali HB p. 151, plate 50 facing p. 101
   Remark: These birds fly high up in the air but rains bring them near to the ground. Their shrill, joyous screaming notes are chee, chee. The birds roost at night in fissures of cliffs.

2. **THE WHITE-THROATED SPINETAIL SWIFT**
   Chaetura caudacutus
   Remark: The bird is amongst the world's fastest fliers. Its estimated speed is about 150 miles per hour. 'The sound of their wings as they hurtle through the air can be heard a long distance away.'

3. **THE EASTERN SWIFT**
   Micropus apus pekinensis
   Remark: It is a smaller and slimmer swift with long, pointed, narrow wings.

4. **BLYTH'S WHITE-RUMPED SWIFT**
   Micropus pacificus leuconyx
   Salim Ali HB p. 152

5. **THE HOUSE-SWIFT**
   Micropus affinis

In our classification of birds such diverse fliers as kingfishers, bee-eaters, rollers, hoopoes and hornbills come after swifts. They all belong to a single order the Coraciiformes. The Kingfisher is not listed in Salim Ali's 'Hill Birds'. Hence its family is represented by a Himalayan Kingfisher from 'Indian Birds'.

**THE KINGFISHERS**

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</tbody>
</table>
genus and species:
1. THE HIMALAYAN PIED KINGFISHER
   Ceryle lugubris
   Salim Ali IB p. 56/72
   Remark: This beautiful Kingfisher has a prominent crest. It occurs in the Himalayas above 2,500 feet.

THE BEE-EATER

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genus and species:
1. THE BLUE-BEARDED BEE-EATER
   Alcemerops atertoni Jardine and Selby
   Salim Ali HB p. 147, plate 48 between pages 100-101
   Call: harsh, guttural kor-r-r, kor-r-r
   Remark: This large and handsome bee-eater lives in evergreen or wet deciduous forests. In the Himalayas, it is found from foothills (Dehra Dun) to about 5,000 feet.

THE ROLLERS

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genera and species:
1. THE ROLLER
   Coracias benghalensis (Linnaeus)
   Salim Ali IB p. 54/70

2. THE KASHMIR ROLLER
   Coracias garrulus semenowi
   Salim Ali IB p. 54/70
   Remark: Both these birds are not listed in Salim Ali's 'Hill Birds', but are quite common on telegraph wires along roadsides and railway tracks. By this token they are likely to occur in the lower Himalayas.

THE HOOPOES

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</table>
genus and species:

1. THE HOOPOE
   Upupa epops Linnaeus
   Salim Ali IB p. 59/68
   Remark: The bird occurs throughout India up to 5,000 feet and is very likely to
   be in Garhwal and Kumaon. It has a soft, musical, penetrating call hoo-po or hoo-
   po-po.

THE HORNBIKS

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genus and species:

1. THE LARGE INDIAN PIECED HORNBILL
   Anthracoceros malabaricus
   Salim Ali HB p. 148
   Remark: In the Himalayas, this large bird is found from well-wooded foothills
   up to about 5,000 feet.

   The last of non-passerine birds are barbets and woodpeckers. The former are
   much heard than seen whereas the latter are much seen than heard: they give a
   good company in the forest.

THE BARBETS

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genera and species:

1. THE GREAT HIMALAYAN BARBET
   Megalaima virens marshallorum Swinhoe
   Salim Ali HB p. 140, plate 46 facing p. 93
   Remark: The call of this bird is heard in summer throughout the Himalayas between
   4,000 and 9,000 feet. The bird renders a far-reaching monotonous chorus mewli,
   mewli, mewli, from which it derives its name 'Mewli' in Garhwal. Another call
   is a quick gyok-gyok-gyok.

2. THE BLUE-THROATED BARBET
   Megalaima asiatica
   Call: loud kutroo, kutroo
   Remark: It is found throughout the Himalayas from plains to 6,000 feet elevation.

3. THE GREEN BARBET
   Megalaima zeylonicus
   Salim Ali HB p. 142
   Call: loud kor-r-r ... kutroo, kutroo ...
4. **THE LINEATED BARBET**
   *Megulactions lineatus*
   
   **Remark:** A bird of the Himalayan foothills, it is also seen around Mussoorie. Its call is the same as that of the Green Barbet.

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**THE WOODPECKERS**

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**genera and species:**

1. **THE SCALY-BELLIED GREEN WOODPECKER**
   *Picus squamatus* Gould
   Salim Ali HB p. 135, plate 44 between pages 92-93
   
   **Remark:** The Himalayan forests are the home of some lovely colourful woodpeckers. This one runs up the trunks of trees directly or in spirals, in a series of jerky spurts. Its pleasing acrobatics are accompanied by loud drumming which it achieves by rapidly striking its bill on the trees' bark. Its music consists of one or two or at the most three notes but the call is high-pitched, clear and far-reaching. The bird is found between 5,000 and 11,000 feet.

2. **THE LITTLE SCALY-BELLIED GREEN WOODPECKER**
   *Picus vittatus*
   
   **Remark:** It is a similar but smaller bird than the one above and is found up to 5,000 feet only.

3. **THE BLACK-NAPE GREEN WOODPECKER**
   *Picus canus*
   
   **Remark:** This woodpecker is as large as the first one but differs in the coloration. It is found up to 8,000 feet only.

4. **THE HIMALAYAN PIED WOODPECKER**
   *Dryobates himalayensis* Jardine and Selby
   Salim Ali HB p. 136, plate 44 between pages 92-93
   
   **Remark:** This beautiful woodpecker inhabits the well-wooded slopes of fir, oak and rhododendron mixed forest. It is found between 3,000 and 9,000 feet and habitually eats quantities of the Chir pine seeds. Its acrobatics are similar to those of other members of its family.

5. **THE BROWN-FRONTED PIED WOODPECKER**
   *Dryobates auriceps*
   
   **Remark:** The bird is similar to the fourth one and is found between 2,000 and 7,000 feet in the Western Himalayas.

6. **THE FULVOS-BREASTED PIED WOODPECKER**
   *Dryobates macei*
   
   **Remark:** This woodpecker is found in the Himalayan forest from Murree to East Assam, from the foothills up to 6,500 feet.
7. THE GOLDEN-BACKED WOODPECKER  
*Brachypternus benghalensis*  
Salim Ali HB p. 138  
**Remark:** Found only in the Himalayan foothills and elsewhere in India.

8. THE SPOTTED PICULET  
*Vivia innominata* Burton  
Salim Ali HB p. 139, plate 44 between pages 92-93  
**Call:** sharp, squeaky spit, spit  
**Remark:** A diminutive woodpecker, it jerkily runs up and down or circles around the trunks of small trees and shrubs. It is found in the Himalayan foothills as well as in mountains up to 6,000 feet and locally goes up to 9,000 feet. Its acrobatics are the same as those of other birds in the family.

9. THE INDIAN PIGMY WOODPECKER  
*Dryobates nanus*  
**Remark:** This is one more diminutive woodpecker which is found up to 6,000 feet in the Himalayas.

All the birds listed so far are non-passerine. Now we turn to the passerine ones, that is, those perching birds which form the single largest order, the Passeriformes. These include such birds like robins, bulbuls, orioles, flycatchers, flowerpeckers, sunbirds, etc. In fact, about 2/3 of the world's birds are passerine.

Among the passerine birds, many are fond of flowers and their nectar. However, as a general rule, all birds have comparatively poor sense of taste and that of smell is practically nil. On the whole, birds have remarkable eyesight: "In rapid accommodation of the eye, the bird surpasses all other creatures. The focus can be altered from a distant object to a near one almost instantaneously; as an American naturalist puts it, 'in a fraction of time it (the eye) can change itself from a telescope to a microscope'."

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**THE PITTAS**

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**genus and species:**

1. THE INDIAN PITTA  
*Pitta brachyura* (Linnaeus)  
Salim Ali IB p. 47  
**Remark:** The bird is found in the well-wooded Himalayan foothills up to 2,500 feet.

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**THE LARKS**

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genera and species:

1. **THE HORNED LARK**
   Otocoris alpestris Linnaeus
   Salim Ali HB p. 124, plate 67 facing p. 140, plate 71 facing p. 148
   Remark: This is a high altitude bird (10,000 to 16,000 feet) and is never found near the foothills or the hill stations. For a lark, it is not a good songster.

2. **THE SMALL SKYLARK**
   Alauda gulgula Franklin
   Salim Ali HB p. 125
   Remark: The bird is of insignificant look but is a great songster. It soars vertically upwards singing louder and louder as it rises higher and higher until it is almost out of sight. Then it becomes stationary for a while without any interruption in its 'spirited, loud, clear, melodious' song. And then, as it fancies, it drops dead like a stone for some distance when it opens its wings to arrest the fall. It returns to its perch in several such successive drops. Larks love to live in flocks and are found near green meadows.

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**THE SWALLOWS**

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genera and species:

1. **THE COMMON SWALLOW**
   Hirundo rustica Linnaeus
   Salim Ali HB p. 115, plate 41 between pages 84-85
   Remark: The arrival and departure of swallows could readily be seen in winter as these birds gather in enormous swarms on telegraph wires. The pleasing aspect of these beautiful birds is their flight which is swift, graceful and amazingly effortless. Their song though pretty is feeble and twittering. In spring and summer these birds are plentiful in and around the Himalayan hill stations.

2. **THE WIRE-TAILED SWALLOW**
   Hirundo smithii
   Remark: This bird differs from the one above in its coloration, and by the two long, fine 'wires' in its tail. In the Himalayas, it is found up to 5,000 feet.

3. **SYKES'S STRIATED SWALLOW**
   Hirundo daurica erythropygia
   Salim Ali HB p. 116
   Remark: A race of this bird called nepalensis breeds in the Himalayas between 3,000 and 10,000 feet.

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**THE MARTINS**

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genera and species :

1. THE CRAG-MARTIN  
   Riparia rupestris Scopoli  
   Salim Ali HB p. 113  
   Call : A soft, low, musical chit, chit  
   Remark : It is found in Kumaon between about 6,000 and 14,000 feet wherever cliffs and rock scarps abound.

2. THE HOUSE-MARTIN  
   Delichon urbica  
   Salim Ali HB p. 114  
   Remark : In the Himalayas, the bird occurs between 5,000 and 15,000 feet.

THE SHRIKES

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genera and species :

1. THE BLACK-HEADED SHRIKE  
   Lanius nigriceps Franklin  
   Salim Ali HB p. 89, plate 36 between pages 76-77  
   Remark : An inhabitant of openly-wooded country, it is found between about 4,000 and 6,000 feet in the Himalayas (from Garhwal east to Assam). Known as a 'Butcher Bird', it maintains 'regular larders where surplus food is stored impaled upon thorns to be eaten at leisure.' Food consists of grasshoppers and the likes. The bird is an exceptionally fine songster, but its usual calls are loud and harsh.

2. THE RUFIOUS-BACKED SHRIKE  
   Lanius schach  
   Remark : This is a widely distributed bird of India. In the Himalayas, it is found up to 12,000 feet in summer.

THE ORIOLES

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genera and species :

1. THE GOLDEN ORIOLE  
   Oriolus oriolus Linnaeus  
   Salim Ali HB p. 101, plate 39 facing p. 84  
   Remark : This is the most popular bird with lovely gold, black and red (beak) colours. It is called the Mango Bird because it is fond of orchards of mango and other fruits. In the Himalayas, it can be found up to 6,000 feet. There, the trees it prefers are chenan, shisham and toon. Its ordinary call note chee-ah is harsh, but it is followed by liquid musical whistles which sound like pi-lo-lo. Another more familiar oriole is the Black-headed one [Oriolus xanthornus] which in appearance looks similar except for the jet-black head.
2. THE MAROON ORIOLE
Oriolus traillii
Salim Ali HB p. 102
Remark: This bird’s colours are deep black and shining maroon red.

THE DRONGOS

class Aves
order Passeriformes
family Dicruridae

genera and species:
1. THE GREY DRONGO
   Dicrurus longicaudatus Jerdon
   Salim Ali HB p. 92
   Remarks: In habits this bird is as good as any other drongo. It is found practically everywhere in the Himalayas up to 8,000 feet.

2. THE BLACK DRONGO
   Dicrurus macrocercus
   Remark: This is the common drongo, the Kotwal, of the plains and seen on telegraph wires. It is also found in the Outer Himalayas.

3. THE BRONZED DRONGO
   Chaptia aenea
   Remark: A smaller edition of the one above, it is also found in the Outer Himalayas.

4. THE WHITE-BELLED DRONGO
   Dicrurus caerulescens
   Remark: In the Himalayas, the bird is found in Garhwal and in restricted tract it ascends up to 6,000 feet.

5. THE RACKET-TAILED DRONGO
   Dissemurus paradiseus
   Remark: This bird has two long, thin, spatula-tipped streamers in the tail. Otherwise it looks like the black drongo. In the Himalayas, it occurs from Mussooree to Assam.

6. THE HAIR-CRESTED DRONGO
   Chibia hententotta
   Remark: It is a forest bird with the same distribution as the third one.

THE MYNAS

class Aves
order Passeriformes
family Sturnidae
genera and species:

1. THE JUNGLE MYNA
   AEthiopsar fuscus Wagler
   Salim Ali HB 103
   Remark: As the name suggests the bird is a resident of jungles. In the Himalayas it is found up to 7,000 feet. In voice and manner it is like common Myna.

2. THE COMMON MYNA
   Acridotheres tristis
   Remark: This is the common bird of India and everyone is familiar with it. Locally, it is found in the Himalayas up to 10,000 feet.

3. THE GRACKLE or HILL MYNA
   Gracula religiosa
   Remark: It is a nice talker and hence a popular cage bird. It is found in the Outer Himalayas.

THE JAYS

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genera and species:

1. THE BLACK-THROATED JAY
   Garrulus lanceolatus Vigors
   Salim Ali HB p. 6
   Remark: The Jays are purely Himalayan birds. They are found in the foliage of Banj-oaks and the associated forests between 5,000 and 7,000 feet. They are fond of ripe acorns and pluck them in autumn. In other ways they are as noisy as the crows.

2. THE HIMALAYAN RED-CROWNED JAY
   Garrulus bispectialis Vigors
   Salim Ali HB p. 8, plate 4 between pages 12-13
   Remark: The habitation of this bird is the same as the one above and they are sometimes seen side by side in a tree. Their behaviour too is alike.

THE MAGPIES

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genera and species:

1. THE RED-BILLED BLUE MAGPIE
   Urocissa erythrorhyncha Boddaert
   Salim Ali HB p. 3, plate 2 facing p. 5
Remark: It is a common bird at all the West Himalayan hill stations. Arboreal in habit, it is found among the branches of oaks, rhododendrons and pines. Though a noisy bird like its cousins, it is a great mimic and imitates the calls of several birds including that of a Cuckoo.

2. **THE YELLOW-BILLED BLUE MAGPIE**
   *Urocissa flavirostris*
   Salim Ali HB p. 4
   Remark: The bird is found side by side with the one above.

### THE TREE-PIES

**genera and species:**

1. **THE HIMALAYAN TREE-PIE**
   *Dendrocitta formosae Swinhoe*
   Salim Ali HB p. 5, plate 3 facing p. 12
   Remark: The bird lives in thick forest at elevations ranging from 2,000 to 7,000 feet. Largely arboreal, it prefers broad-leaved trees, mainly oaks and rhododendrons. It is noisy but some of its calls are quite melodious.

2. **THE INDIAN TREE-PIE**
   *Dendrocitta vagabunda*
   Remark: It resembles its Himalayan cousin.

### THE NUTCRACKERS

**genera and species:**

1. **THE HIMALAYAN NUTCRACKER**
   *Nucifraga caryocatactes Linnaeus*
   Salim Ali HB p. 9, plate 5 between pages 12-13
   **Call:** loud, guttural krack, krack, krack. Noisy like crows.
   Remark: The bird dwells in pine, spruce, fir and deodar forests. In winter it comes down to 3,000 feet but in summer moves up to 6,000 to 13,000 feet. It is an expert in cracking the cones of pine and spruce and eats their seeds.

2. **THE LARGE-SPOTTED NUTCRACKER**
   *Nucifraga multipunctata*
   Remark: The bird is found in the same locality as the one above and has more or less identical characteristics.
THE CHOUHS

genera and species:
1. THE RED-BILLED CHOUGH
   Pyrrhocorax pyrrhocorax Linnaeus
   Salim Ali HB p. 10, plate 6 facing p. 13
   Call: shrill and musical chiaow, chiaow
   Remark: The bird looks very much like a crow but lives at high altitude in the
   Himalayas. In winter it is found at 5,000 feet but in summer it seeks out jagged
   peaks and crags between 8,000 and 16,000 feet and is famous for its aerial contortions.

2. THE YELLOW-BILLED CHOUGH
   Pyrrhocorax graculus
   Call: shrill loud chirp and cree cree
   Remark: Except for the bill and legs the bird looks like the one above. The Everest
   Expedition of 1924 found it up to 27,000 feet.

THE CROWS

genera and species:
1. THE JUNGLE CROW
   Corvus macrorhynchos Wagler
   Salim Ali HB p. 1, plate 1 facing p. 4
   Remark: It is said that crows are black everywhere which means that they need
   no introduction. However, we may add that this crow is a large one and lives in
   jungles.

2. THE RAVEN
   Corvus corax
   Salim Ali HB p. 1, photo plate 71 facing p. 148
   Remark: An enlarged edition of the one above, it is a Himalayan bird of high
   altitude. It is remarkable for its aerobatics around some precipitous cliff.

THE CUCKOO-SHRIKES

class Aves
order Passeriformes
family Campephagidae
genus and species:

1. THE LARGE CUCKOO-SHRIKE
   Coracina novaehollandiae (Gmelin)
   Salim Ali IB p. 22
   Call: shrill but pleasant double-noted ti-eee
   Remark: The bird is not listed among the hill birds but is found 'in the entire Indian Union (excepting East Punjab and Rajasthan) from about 4,000 feet in the Himalayas.'

THE MINIVETS

class  Aves
order  Passeriformes
family  Campephagidae

genera and species:

1. THE SHORT-BILLED MINIVET
   Pericrocotus brevirostris Vigors
   Salim Ali HB p. 90, plate 37 between pages 76-77
   Call: clear, musical whistling double-note wee twee? or wi-weet?
   Remark: Being strictly arboreal these birds 'flit among the verdent tree tops or fly across in a loose flock up or down a hillside' and present in the sun a flashing spectacle of singular loveliness and charm. In the Himalayas during summer they are found between 3,000 and 10,000 feet.

2. THE SCARLET MINIVET
   Pericrocotus speciosus Vigors
   Salim Ali HB p. 91
   Remark: Found in the same territory as the one above, the bird differs only in colours and has identical character.

THE CHLOROPSES

class  Aves
order  Passeriformes
family  Irenidae

genera and species:

1. THE ORANGE-BELLIED CHLOROPYSIS
   Chloropsis hardwickii Jardine and Selby
   Salim Ali HB p. 43, plate 21 between pages 44-45
   Remark: The Chloropsis is not readily seen because its colours match so perfectly well with leaves. However, its presence is detected by its melodic music of uncommon richness. Indeed, it is a fine songster and a mimic and is found in the Himalayas among other places in Simla and Mussooree right from the lower levels to 6,000 feet.

2. THE GOLD-FRONTED CHLOROPYSIS
   Chloropsis aurifrons
   Remark: This is another variety of Chloropsis which has the same distribution as the one above.
THE BULBULS

genera and species:

1. THE BLACK BULBUL
Microscelis psaroides Vigors
Salim Ali HB p. 45, plate 22 facing p. 45
Call: squeaky-squeak followed by a pretty and most attractive whistle whew-whe, whew-whe
Remark: The bulbuls are favourite of Indians and the name is a household word. This bulbul is found in the Himalayas between 2,000 and 10,000 feet and is fond of the nectar of rhododendron flowers.

2. THE WHITE-CHEEKED BULBUL
Molpastes leucogenys Gray
Salim Ali HB p. 47, plate 23 facing p. 52
Remark: This is one more beautiful bulbul. It occurs everywhere in the Himalayas between 2,000 and 9,000 feet and prefers open scrub jungles full of wild raspberry and other bushes. It sings no song but has a number of cheerful rollicking notes to offer.

3. THE RED-WHISPERED BULBUL
Otocompsa jacobs

4. THE RED-VENTED BULBUL
Molpastes cafer
Remark: This bulbul too is common in the Himalayas and is found up to 5,000 feet.

THE BABBLERS

genera and species:

1. THE RUSTY-CHEEKED SCIMITAR-BABBLER
Pomatorhinus erythrogenys Vigors
Salim Ali HB p. 35, plate 17 between pages 36-37
Call: q-p ... quip, q-p ... quip and harsh chattering che-che-che-che
Remark: The birds form family parties of four to six and are heard rather than seen during morning walk at most of the Himalayan hill stations.

2. THE SLATY-HEADED SCIMITAR-BABBLER
Pomatorhinus schisticeps
Remark: This Himalayan babbler is a bit smaller than the one above, otherwise, it has a more or less overlapping distributional range.
THE SPOTTED BABBLER
PELLORNEUM RUFICEPS SWAINSON
Salim Ali HB p. 36, plate 16 between pages 36-37
Call: musical weet
Remark: Babblers on the whole are shy birds. They keep to dense thickets and undergrowth in evergreen as well as deciduous forests and are difficult to observe but sometimes they become bold and come out and ignore the passers-by. They keep in touch with their party members by the call weet. Otherwise too, they have rich, mellow whistling notes pret-ty sweet or he'll beat you.

THE BLACK-HEADED SIBIA
LEIOPTILA CAPISTRATA VIGORS
Salim Ali HB p. 39, plate 18 facing p. 37
Call: (i) loud, shrill, ringing tiri-rere-rere; (ii) titteree-titteree-tweeyo; (iii) clear, mournful high-pitched whistling sound chi-whichee-yew-yew-yew.
Remark: This handsome bird is quite common about most of the Himalayan hill stations. Being arboreal, it prefers dense, moist forest of oak and rhododendron and is also fond of flower nectar.

THE RED-BILLED LEIOTHRIX OR 'PEKIN ROBIN'
LEIOTHRIX LUTEA SCOPOLI
Salim Ali HB p. 40, plate 19 facing p. 44
Call: pleasant conversational tee-tee-tee
Remark: It is a purely Himalayan bird. The flock of six or seven birds form a party and hop about among raspberry thickets or hide below shady undergrowth of fir and pine or oak and rhododendron forests. A fine songster, it has a loud, cheerful melody rich in tone and variation.

THE RED-WINGED SHRIKE-BABBLER
Pteruthius erythropterus Vigors
Salim Ali HB p. 42, plate 20 between pages 44-45
Call: a loud kik ... kew-kew ... kew-kew ... kew-kew
Remark: Being arboreal, in winter, these birds are found in mixed oak, chestnut and rhododendron forests. In summer they move higher to fir and deodar forest.

THE SILVER-EARED MESIA
MESIA ARGENTATORIUS HODGSON
Salim Ali HB p. 44, plate 19 facing p. 44
Remark: This colourful bird is a cousin of the 'Pekin Robin' and shares many of its habits. It utters clear, loud whistling notes and prefers the broad-leaved evergreen forests of oak, chestnut and rhododendron. It is found in the Himalayas east of Garhwal from about 500 to 5,000 or 7,000 feet.

THE LAUGHING-THRUSHES

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genera and species:

1. THE WHITE-CRESTED LAUGHING-THRUSH
   Garrulax leucolophus Hardwicke
   Salim Ali HB p. 21, plate 11 facing p. 28
   Remark: The Laughing-Thrushes are Babbler and not Thrushes and hence belong to the same family as of Babbler. The name 'Laughing-Thrush' is a bit confusing which necessitates to put the bird in a separate grouping.

   Like babbler this bird forms 'sisterhood' of six to ten birds and keeps up its noisy chatter all the time. One begins by a call, the second takes up and in no time the 'sisterhood' bursts 'into a chorus of the peculiar loud discordant laughter' which has earned this group of birds its name. The bird is on the whole a resident of the Himalayan foothills (2,500 to 5,000 feet) east of Simla and prefers Sal jungles. Insects are its natural food but it is fond of berries and flower nectar and hence the 'sisterhood' is often found near flowering bushes.

2. THE WHITE-THROATED LAUGHING-THRUSH
   Garrulax albogularis Gould
   Salim Ali HB p. 13, plate 13 between pages 28-29
   Remark: A common bird around most of the West Himalayan hill stations between about 4,000 and 9,000 feet, it frequents hill oak forests with undergrowth of ringal and is a little more arboreal than its cousins. The 'sisterhood' keeps up its peculiar short, rather high-pitched ke, ke and the so-called laughter is mixed with hissing and squealing calls which are shriller.

3. THE RED-HEAD LAUGHING-THRUSH
   Trochalopteron erythrocephalum Vigors
   Salim Ali HB p. 26, plate 14 facing p. 29
   Call: a clear musical double whistle, pheeou-pheeou, or teew-teew followed by teew-ew-ew ... teew-ew-ew
   Remark: Practically the whole of the Indian Himalayas are the home of this bird. It summers between 6,000 and 10,000 feet and winters around 4,000 feet. Being shy, it keeps to thickets of ringal bamboo, oak, pine and silver fir forest, and is rarely seen. The 'sisterhood' is quiet and does not burst into laughing choruses; however, its presence is given away by the sweet call.

4. THE VARIEGATED LAUGHING-THRUSH
   Trochalopteron variegatum Vigors
   Salim Ali HB p. 27, plate 14 facing p. 29
   Call: a clear, loud whistling note: p'tee-whee, p'tee-whee
   Remark: The bird is found between Kashmir and Nepal — the western race being simile and the eastern being variegatum — with Dharamsala in Kangra District as the divide. It resides in open forests of silver fir, birch and horse-chestnut with plenty of undergrowth or thickets of ringal. The 'sisterhood' is noisy.

5. THE STREAKED LAUGHING-THRUSH
   Trochalopteron lineatum Vigors
   Salim Ali HB p. 31, plate 15 facing p. 36
   Remark: This Laughing-Thrush is found throughout Himalayas between 5,000 and 8,000 feet and is 'one of the commonest and most familiar birds of all the West Himalayan hill-stations'. In the breeding season the male sings its loud, clear whistling song: pitt-we-are or titty-titty-we-are.
6. **THE STRIATED LAUGHING-THRUSH**  
Grammatoptila striata Vigors  
Salim Ali HB p. 32, plate 15 facing p. 36  
**Remark:** Except Kashmir, the bird is found throughout Himalayas between 4,000 and 7,000 feet. It is 'one of the commoner birds of its kind about all the hill-stations within its range, and perhaps particularly so about Simla, Naini Tal and Darjeeling.' Its habits are like those of its cousins, but it keeps on upper branches and crowns of trees. Noisy, it has 'a large variety of discordant cackling or clucking notes. The loud lively whistling call, which one observer renders as O see saw whitey — oh white, resounds in the forest and is quite intriguing when heard for the first time.'

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**THE FLYCATCHERS**

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**genera and species:**

1. **THE SOOTY FLYCATCHER**  
Hemicichlidon sibirica Gmelin  
Salim Ali HB p. 74, plate 33 between pages 68-69  
**Remark:** This wholly insectivorous flycatcher frequents silver fir, spruce and birch forests in the Himalayas. During summer it is found between 6,000 and 11,000 feet but in winter it comes down to lower foothills.

2. **THE FERRUGINOUS FLYCATCHER**  
Hemicichlidon ferruginea  
**Remark:** The home of this bird is the Central and Eastern Himalayas. In summer it is seen in Garhwal between 4,000 and 6,000 feet.

3. **THE RED-BREASTED FLYCATCHER**  
Muscicapla (Sipha) parva Bechstein  
Salim Ali HB p. 75, plate 33 between pages 68-69  
**Call:** low double click-click.  
**Remark:** This is a bird of groves and orchards but sings no song.

4. **THE INDIAN RED-BREASTED FLYCATCHER**  
Sipha hyperythra  
**Remark:** In summer this West Himalayan bird is found between 6,000 and 8,000 feet and in winter goes to Ceylon but does not like to live anywhere else in India.

5. **THE ORANGE-GORGETED FLYCATCHER**  
Sipha strophiata  
**Remark:**

6. **THE WHITE-BROWED BLUE FLYCATCHER**  
Muscicapula superciliaris Jerdon  
Salim Ali HB p. 76, plate 33 between pages 68-69  
**Call:** chr-r-r or tr-r-r
Remark: This dainty little flycatcher is found all over the Himalayas and gathers in large numbers in and around Simla, Mussoorie and other Himalayan hill stations. It lives in the mixed forests of conifers and broad-leaved trees such as blue pine, silver fir, hill-oak and rhododendron. In summer it is seen between 5,000 and 10,000 feet in the Western Himalayas.

7. THE SLATY-BLUE FLYCATCHER
   Muscipula tricolor
   Remark: This is another dainty little flycatcher which has almost overlapping Himalayan distribution.

8. THE BLUE-THROATED FLYCATCHER
   Muscipula rubeculoides
   Salim Ali HB p. 78
   Remark: In summer it is found all over the Himalayas between 2,500 and 6,000 feet.

9. THE VERDITEF FLYCATCHER
   Eumyias thalassina Swainson
   Salim Ali HB p. 79, plate 34 facing p. 69
   Call: click, click
   Remark: The bird is without doubt the commonest and most familiar flycatcher of at least the West Himalayan hill-stations. It sits on overhead electric wires and has pleasant jingling song.

10. THE RUFIOUS-TAILED FLYCATCHER
    Alceonax ruficaudus Swainson
    Salim Ali HB p. 80, plate 33 between pages 68-69
    Remark: A bird of the Western Himalayas, it is seen in Garhwal in summer between 7,000 and 11,000 feet. It prefers spruce and deodar forests as much as the open oak and rhododendron forests. It has a loud, short song of three to four notes.

11. THE BROWN FLYCATCHER
    Alceonax latirostris
    Salim Ali HB p. 81

12. THE GREY-HEADED FLYCATCHER
    Cincicapa ceylonensis Swainson
    Salim Ali HB p. 83, plate 34 facing p. 69
    Remark: The race 'pallidor' breeds in the Himalayas between 3,000 and 8,000 feet. It prefers well-wooded ravines of oak and deodar. The bird has a pretty little interrogative whistling song of five notes: Q: Chik! ... whichee whichee! Ans: whi-chi-chi.

13. THE RUFIOUS-BELLIED NILTAVA
    Niltaea sundara Hodgson
    Salim Ali HB p. 84, plate 35 facing p. 76
    Remark: This is a magnificent bird whose beauty captivates the heart of bird-watchers and as if that is not enough the bird sings an equally magnificent song whose details are unfortunately still unrecorded. The West Himalayan race is called fastuos and is a little different in colour. In summer it is found between 5,000 and 8,000 feet and in winter it goes down into the lower foothills.
14. THE SMALL NILTAVA
Niltava macgrigoriae
Remark: It is smaller and has somewhat different colours. It is found throughout the Himalayas east of Mussoorie.

15. THE PARADISE FLYCATCHER
Tchitrea paradisi Linnaeus
Salim Ali HB p. 85, plate 34 facing p. 69
Call: a harsh and grating che or che-che.
Remark: For its exquisite snow-white beauty perhaps this bird has no peer. It has no song but is not totally devoid of some pleasant musical notes. The bird has not escaped notice and has acquired various names: Rocket Bird, Widow-Bird and Ribbon-Bird. The last one comes from its 10 to 15 inches long white streamers which are in its tail. The body is white with metallic-black head. In the Himalayas, its summer home is between 3,000 and 8,000 feet, in winter it seeks the Himalayan foothills. Mulberry groves and Mango orchards are its favourite haunts.

16. THE WHITE-THROATED FANTAIL-FLYCATCHER
Rhipidura albicollis Vieillot
Salim Ali HB p. 88, plate 33 between pages 68-69
Call: harsh chuck or chuck-r
Remark: This is a low level (under 4,000 feet) bird in the Himalayas but sometimes reaches out to higher levels (7,000 feet). It has a feeble rather jerky whistling song chik ... cheechik-cheechik but is famous for its ceaseless waltzing and pirouetting under the canopy of thickets.

THE WARBLERS

class Aves
order Passeriformes
family Muscicapidae
subfamily Sylviinae

genera and species:

1. THE YELLOW-BELLIED or TICKELL'S WILLOW WARBLER
Phylloscopus affinis Tickell
Salim Ali HB p. 95, plate 38 facing p. 77
Call: sparrow-like tsiip
Remark: Small though the bird is, it scales great heights (15,000 feet). In summer it hops in the open alpine scrub forests of dwarf juniper, rhododendron and berberis. In winter it goes below 7,000 feet right up to plains. The bird is gregarious in habit and a party of 20 birds is not uncommon. Their song consists of single note: pick ... whiwhiwhiwhiwhi.

2. THE OLIVACEOUS TREE-WARBLER
Phylloscopus griseolus
Call: pick ... pick
Remark: This bird is so close in colours to the one above that it is difficult to tell them apart.
3. **THE LARGE CROWNED WILLOW WARBLER**  
*Phylloscopus occipitalis* Blyth  
*Salim Ali* HB p. 96, plate 38 facing p. 77  
Call: *tiss-yip*  
Remark: These birds breed during summer in the West Himalayas between 6,000 and 9,000 feet. They are mostly seen in parties among bushes and trees and are restless and never keep quiet for a moment. They sing a high pitched rather monotonous song *chik ... wee-chwee, wee-chwee, wee-chwee* for the whole day.

4. **THE KASHMIR CROWNED WILLOW-WARBLER**  
*Phylloscopus reguloides* kashmiriensis  
Remark: The bird could be confused with the one above in their breeding ground but it is a rare one.

5. **THE GREENISH WILLOW-WARBLER**  
*Phylloscopus trochiloides* viridanus  
Call: *cheerful chiwee*

6. **THE GREEN WILLOW-WARBLER**  
*Phylloscopus nitidus*  
Call: *cheerful chiwee*

7. **THE GREY-HEADED FLYCATCHER-WARBLER**  
*Seicercus xanthoschistos* Gray  
*Salim Ali* HB p. 97, plate 38 facing p. 77  
Remark: This bird's habits are 'a cross between those of a tree-warbler and a flycatcher, and thus its double-barrelled name seems singularly well-fitting.' It is a common bird around the West Himalayan hill-stations and is found in the foliage of pine, oak and other tall trees. In summer it sings its monotonous song at all hours of the day.

8. **THE BLACK-BROWED FLYCATCHER-WARBLER**  
*Seicercus burkii*  
*Salim Ali* HB p. 98

9. **THE BROWN HILL-WARBLER**  
*Suya criniger* Hodgson  
*Salim Ali* HB p. 99, plate 38 facing p. 77  
Call: *loud p'ty, p'ty, p'ty*  
Remark: A common bird about most Himalayan hill stations, it is found in bushes or small trees. It is famous for executing superb nose-dive down a steep ravine with astounding velocity. The bird has wheezy, grating and rather monotonous song: *tsee-tsee-tsee-tsee-tsee*.

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**THE SHORTWING**

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208
genus and species:
1. **HODGSON’S SHORTWING**
   Hodgsonius phoenicuroides
   Salim Ali HB p. 61
   Call: a rather mournful whistling pee-pee-pit
   Remark: A bird of open scrub jungle, it occurs in the Himalayas between 6,000 and 12,000 feet.

**THE RUBYTHROAT**

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genus and species:
1. **THE HIMALAYAN RUBYTHROAT**
   Calliope pectoralis Gould
   Salim Ali HB p. 61, plate 27 facing p. 60 and photo plate 69 between pages 140-141
   Remark: This bird of high altitude alpine scrub jungle dwells between 9,000 and 14,000 feet and in summer frequents rocky hillsides with Juniper and Berberis and in winter visits the foothills. Its behaviour reminds us of the Indian Robin. Finally, its lovely and pleasant song is very similar to that of the Pied Bush-Chat.

**THE CHATS**

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genus and species:
1. **THE INDIAN BLUE CHAT**
   Luscinia brunnea Hodgson
   Salim Ali HB p. 54, plate 26 facing p. 53
   Call: chr-r-r
   Remark: The bird breeds in the Himalayas between 5,000 and 10,000 feet and is seen everywhere from Kashmir to Garhwal to Bhutan. Its habitat is the dense undergrowth of fir and mixed forest in which it normally hides from the passer-by. However, in summer its presence is given away by the male’s short sweet song of three to four monotonous notes: jerri, jerri, jerri or phwee, phwee, phwee followed by tree-tre-tre-tre-tre-tre-tre... The last part of the song is very like that of Robin. In winter it leaves its summer Himalayan quarters and flies to South-West Indian hills where it makes its home in some forest or plantation.
THE ROBINS

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genus and species:

1. **THE RED-FLANKED BUSH-ROBIN**
   Ianthia cyanura Pallas
   Salim Ali HB p. 63, plate 26 facing p. 53
   Call: plaintive pheou
   Remark: A shy and retiring bird it takes shelter in dense bushes which border the Himalayan streams. In summer it is commonly seen between 7,000 and 14,000 feet but in winter it comes down to 5,000 feet. At high altitude it resides in the birch and rhododendron forest. The bird has no song but utters at times pleasant three-noted call.

THE REDSTARTS

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genera and species:

1. **THE WHITE-CAPPED REDSTART**
   Chaimarrornis leucocephalus Vigors
   Salim Ali HB p. 59, plate 29 between pages 60-61
   Call: a loud, shrill and plaintive tsee
   Remark: This high altitude bird spends its summer months along the rocky Himalayan streams and torrents. Trekkers do not miss it because it is a common conspicuous bird seen between 6,000 and 16,000 feet. It hops all the time among rocks.

2. **THE PLUMBEOUS REDSTART**
   Rhycornis fuliginosus Vigors
   Salim Ali HB p. 60, plate 29 between pages 60-61
   Remark: In the Himalayas, this bird is mostly seen side by side with the one above (4,000 to 14,000 feet) as both prefer rocky Himalayan streams. Their antics are similar and it is delightful to watch them again and again. However, the present bird scores over its cousin in one respect: it has a pleasant but feeble whistling song, chik ... cheechik-cheechik.

3. **THE BLUE-FRONTED REDSTART**
   Phoenicurus frontalis
   Remark: In summer the bird breeds between 10,000 and 15,000 feet in the Himalayas. Only in winter it is 'common down at most Himalayan hill-stations.'
4. THE COMMON or BLACK REDSTART
   Phoenicurus ochruros
   Remark: The summer habitat of this bird is the same as the one above but in
   winter it 'spreads out practically all over the plains of India.'

   THE FORKTAILS

   genera and species:
   1. THE SPOTTED FORKTAIL
      Enicurus maculatus Vigors
      Salim Ali HB p. 57, plate 28 between pages 60-61
      Call: a sharp kree
      Remark: This is really a beautiful bird. When it hops from stone to stone in rocky
      Himalayan streams (12,000 to 2,000 feet) its bearing, full of elegance, is delightful
      to watch. Its sharp, creaky cheek-chik-chik-chik-chik is also an unforgettable experi-
      ence when it is heard over a mighty rushing torrent.

   2. THE LITTLE FORKTAIL
      Microcichla scouleri
      Remark: 'Found at Himalayan torrents, with an overlapping geographical range'
      as in No. 1 above.

   THE BUSH-CHATS

   genera and species:
   1. THE PIED BUSH-CHAT
      Saxicola caprata Linnaeus
      Salim Ali HB p. 55
      Call: a harsh chek, chek, ending in subdued trweet
      Remark: A bird of open grassy hillsides, it is found up to 8,000 feet in the Himalayas.
      Its pretty whistling song begins with a double chick-chick and resembles that of
      Indian Robin in cadence and tone-quality.

   2. THE COLLARED BUSH-CHAT
      Saxicola torquata
      Remark: In summer, the bird breeds in the Himalayas between 2,000 and 8,000
      feet.
7. **THE RED-HEADED TIT**
   *Aegithaliscus concinnus* Gould
   Salim Ali HB p. 17, plate 9 between pages 20-21

Remark: This dainty little Tit is purely a Himalayan bird. It is 'perhaps one of the commonest and most abundant birds to be met with' in the West Himalayan summer resorts. Flocks of 20 or 30 are rather a rule. And the birds go on hopping restlessly as they utter their shrill pleasant tweet.

### THE NUTHATCHES

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**genera and species:**

1. **THE WHITE-TAILED NUTHATCH**
   *Sitta himalayensis* Jardine and Selby
   Salim Ali HB p. 19, plate 10 facing p. 21

Remark: The name Nuthatch implies that the bird eats nuts of the trees. This is true as it is an expert in opening the nuts and shells of several trees by its pointed bill. The bird is widely spread between 5,000 and 11,000 feet in the Himalayas, however, it is the commonest between 6,000 and 8,000 feet where most of the Himalayan resorts are situated. It frequents the broad-leaved Banj-oak and rhododendron forest and on trees it looks like a little woodpecker as its antics are not too dissimilar. The bird prefers company and the band keeps together by a high-pitched chi-chip.

2. **BROOKS’S or THE KASHMIR NUTHATCH**
   *Sitta kashmiriensis*

Remark: This West Himalayan bird is found right up to Garhwal, otherwise, it is common in Kashmir between 7,000 and 9,000 feet.

3. **THE WHITE-CHEEKED NUTHATCH**
   *Sitta leucopsis*

Remark: The range of this bird too is from Kashmir (North) to Garhwal between about 7,000 and 12,000 feet.

4. **THE CHESTNUT-BELLIED NUTHATCH**
   *Sitta castanea*

Remark: It occurs from Murree to Assam.

5. **THE VELVET-FRONTED NUTHATCH**
   *Sitta frontalis* Swainson
   Salim Ali HB p. 20, plate 10 facing p. 21

Remark: From the Kumaon Himalayas (Naini Tal, Ranikhet and Almora) to Assam, the bird makes its home in well-wooded countryside. As for its other habits, it is in no way different from other nuthatches.
THE WALL-CREEPERS

genus and species:
1. THE WALL-CREEPER
   Tichodroma muraria
   Salim Ali HB p. 50.
Remark: The bird to be named Creeper is unusual. It means that it creeps on something — in this case wall. The present bird is a high altitude Himalayan bird which spends its summer between 12,000 and 16,000 feet and looks very much like Nuthatch. In winter it visits the foothills and even the nearby plains but it comes into real elements only on the cliffs and rock scarps of high Himalayas where it shows its unusual skill of scaling their vertical faces.

THE TREE-CREEPERS

genus and species:
1. THE HIMALAYAN TREE-CREEPER
   Certhia himalayana Vigors
   Salim Ali HB p. 49, plate 24 between pages 52-53
Remark: The bird is found right from Kashmir to Kumaon between 4,000 and 12,000 feet. It inhabits both broad-leaved and coniferous forests. When it spirals around the tree trunk the name 'tree-creeper' comes into evidence and its antics remind us of nuthatches and woodpeckers. It communicates with other members of its group by squeaky notes which sound something like chi-chi ... chiu-chiu-chiu-chiu.

THE PIPITS

genera and species:
1. THE INDIAN TREE-PIPIT
   Anthus hodgsoni Richmond
   Salim Ali HB p. 120
Remark: Pipits in India are many: some come from outside; some from within but all have more or less the same characteristics. Their flight, like wagtails, is undulatory but they do not wag their tail so vehemently. They prefer grassy slopes and on taking off the ground utter tseep.
The Pipit under consideration breeds in the Himalayas during summer and is found from Kashmir to Sikkim and probably in Assam too between 8,000 and 13,000 feet. At higher levels the Alpine meadows are its haunts — elsewhere grassy slopes and patches find favour. In summer the male sings a pretty song and in winter it leaves for the plains all over India.

2. THE TREE-PIPIPIT
   Anthus trivialis
   Remark: This bird differs from theforesaid Pipit a little in colour.

3. THE INDIAN PIPIT
   Anthus rufulus
   Salim Ali HB p. 121
   Remark: This is a common bird of India which is found up to about 5,000 feet in the Himalayas. It differs from the first one in colour tinge and some minor details.

4. THE RUFIOUS ROCK-PIPIPIT
   Anthus similis Jerdon
   Salim Ali HB p. 122
   Remark: This is particularly a large Pipit and there is nothing distinctive about its food or other habits. In summer it is found from Gilgit to Sikkim between 4,000 and 7,000 feet and in winter it visits all India. The bird has no song and utters 'tseep' as all pipits do.

5. THE UPLAND PIPIT
   Oreocorys sylvanus Blyth
   Salim Ali HB p. 123
   Remark: This is a purely Himalayan bird which does not winter in plains as all pipits do. In other respects it is a typical pipit which is found from Kashmir to Nepal between about 4,000 and 10,000 feet and frequents grass-covered slopes of Chir pine forests.

6. HODGSON'S PIPIT
   Anthus roseatus
   Remark: The distinguishing feature of this bird is that its throat becomes pinkish-brown in summer. It breeds in Kashmir and Garhwal and also in other places in the Himalayas at high elevations. It winters in plains as most pipits do. In the Himalayas it is seen on grass-covered slopes of open rhododendron and pine forests.

THE WAGTAILS

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genera and species:

1. HODGSON'S PIED WAGTAIL
   Motacilla alba alboidea Hodgson
   Salim Ali HB p. 117
   Remark: A bird which vehemently wags its tail all the time is a wagtail — an appropriate name indeed. This is one bird which is mostly near damp ground and introduces itself by the movement of its tail. Nobody mistakes it but there is a
catch: it is not easy to distinguish between different wagtails because they are almost alike; hence, one has to be very careful.

In summer, Hodgson's bird is seen practically all over the Himalayas between 6,000 and 10,000 feet. In winter it visits the foothills and very closeby plains. The one place at which it is extremely common is on the boulders of smooth running—not torrential—streams of Kashmir. The bird utters a sharp chipchip, chipchip when it takes off from the ground and continues the chatter afterwards during its undulating flight.

2. **THE MASKED WAGTAIL**
   Motacilla alba personata  
   Salim Ali HB p. 118  
   Remark: In field this bird can be easily confused with the one above.

3. **THE WHITE WAGTAIL**
   Motacilla alba dukhenensis  
   Salim Ali HB p. 118, plate 42 facing p. 85  
   Remark: This wagtail is not mistaken with others because of its whiteness.

4. **THE INDIAN YELLOW-HEADED WAGTAIL**
   Motacilla citreola calcarata Hodgson  
   Salim Ali HB p. 119, plate 42 facing p. 85 and photo-plate 68 between pages 140-141  
   Remark: In summer, Kashmir is full of this bird. Also, it is found in the western Himalayas during the same season right up to Garhwal (5,000 to 15,000 feet). In winter it spreads over the northern India right up to the line of tropic of cancer. The bird is perhaps the most aquatic and is never seen away from water.

5. **THE EASTERN GREY WAGTAIL**
   Motacilla cinerea melanope  
   Remark: A long-tailed wagtail, it breeds in the Himalayas between 6,000 and 12,000 feet.

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**THE FLOWERPECKERS**

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**genera and species:**

1. **THE FIRE-BREASTED FLOWERPECKER**
   Dicaeum ignpectus Blyth  
   Salim Ali HB p. 132, plate 43 facing p. 92  
   Remark: This tiny, brilliantly coloured bird’s home is the Himalayas (5,000 to 12,000 feet) from the Sutlej valley to Arunachal Pradesh. It is purely an arboreal species which is fond of densely forested hills and keeps mostly to the foliage canopy of the lofty trees. Its food among other eatables is flower nectar and it is seen among various orchids. At times it comes down and then its single call note 'chik' is constantly heard as it hops among the twigs or flits from tree to tree.
2. **TICKELL'S FLOWERPECKER**  
Dicaeum erythrorhynchos  
Salim Ali HB p. 134  
**Remark:** Found locally up to 7,000 feet in the Himalayas; however, the bird is chiefly of the plains.

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**THE SUNBIRDS**

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**genera and species:**

1. **THE YELLOW-BACKED SUNBIRD**  
   *Aethopyga siparaja* Raffles  
   Salim Ali HB p. 128, plate 43 facing p. 92  
   **Call:** a sharp, harsh chi-chwee  
   **Remark:** A gem of a bird — tiny and colourful — it is found from Dharamsala to Assam at an elevation of about 7,000 feet. It is a garden bird and is seen around the hill stations as it flits tirelessly from flower to flower.

2. **Mrs. GOULD'S or THE SIMLA YELLOW-BACKED SUNBIRD**  
   *Aethopyga gouldiae*  
   **Remark:** Another jewel of a bird, it is found from the Sutlej valley to Assam between 5,000 and 8,000 feet.

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**THE WHITE-EYES**

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**genus and species:**

1. **THE WHITE-EYE or SPECTACLE-BIRD**  
   *Zosterops palpebrosa* Temm. and schiegel  
   Salim Ali HB p. 127, plate 43 facing p. 92  
   **Remark:** A conspicuous white ring round the eye gives this bird a name 'Spectacle-bird'. In the Himalayas, it is quite common up to 6,000 or locally up to 8,000 feet. It enjoys well-wooded country as well as gardens and a flock of twenty is not uncommon. Being arboreal it spends most of its time amongst the foliage of lofty trees but does not mind to come down for a bath in a garden runnel. Its normal call is a feeble, plaintive cheeping or jingling cheer, cheer, but in its breeding season the male warbles a pretty little tinkling song which commences almost inaudibly and then grows louder until it fades out as it began.
THE SPARROWS

class Aves
order Passeriformes
family Ploceidae
subfamily Passerinae

genera and species :

1. THE CINNAMON TREE-SPARROW
   Passer rutilans Temm. and Laug.
   Salim Ali HB p. 109, plate 40 between pages 84-85
   Remark: It looks like our house-sparrow and though an essentially forest-dwelling
   bird it inhabits the Himalayan villages and hill stations.

2. THE HOUSE-SPARROW
   Passer domesticus
   Salim Ali HB p. 110
   Remark: This is our household bird and needs no introduction. It has even penetrated
   the Himalayas.

3. THE TREE-SPARROW
   Passer montanus
   Remark: The Tree-Sparrow is found throughout Himalayas, west to east, up to
   about 8,000 feet. It is a bird of human habitations as well as of forest and differs
   from the House-sparrow in some details.

THE FINCHES

class Aves
order Passeriformes
family Fringillidae
subfamily Fringillinae

genera and species :

1. THE BLACK-AND-YELLOW GROSBEAK
   Perissospiza icteroides Vigors
   Salim Ali HB p. 104
   Call: a clear, high-pitched pir-riu, pir-riu, pir-riu
   Remark: For a finch, this is a big bird of the size of myna. In the Himalayas,
   it summers around Murree, Mussooree, Naini Tal and other places between about
   6,000 and 10,000 feet. It comes down slightly lower in winter. Coniferous woods
   as well as other Himalayan forests are its haunts and it keeps 'largely to the tall
   firs and deodars, biting into pine cones and eating the seeds.' Finches live in flocks
   and this bird is no exception. The male in breeding season sings a rich, clear and
   pleasing song, pr-r ... toweet-a-tweet.

2. THE ALLIED GROSBEAK
   Perissospiza affinis
   Remark: This is one more finch similar to the one above but of a little different
   colour found in the Himalayas from Hazara to Bhutan.
3. **THE ROSEFINCH**
   Carpodacus erythrinus Pallas
   Salim Ali HB p. 106, plate 40 between pages 84-85
   Call: a pleasant interrogative whistling tooeet or chuee?
   
   Remark: This is a beautiful crimson-pink finch which summers in the Himalayas up to about 10,000 feet from Kashmir to Garhwal and keeps to thickets of wild rose or flocks to birch and silver fir forest. In winter it spreads all over India. The male's breeding season song is a 'bright, cheery refrain of five to eight notes repeated at intervals from a tree or bush not far from the nest.'

4. **THE HIMALAYAN GOLDFINCH**
   Carduelis caniceps Vigors
   Salim Ali HB p. 107, plate 40 between pages 84-85
   Remark: The Goldfinch is a common summer bird of Kashmir but is found right up to Garhwal and Kumaon between 5,000 and 11,000 feet. In winter it descends lower into the foothills and the adjoining plains. Higher up, the bird in small parties frequents pinewoods; lower down, large flocks spread 'amongst weeds and thistles growing on bare hillsides.' Parties of goldfinches 'diligently exploring the thistle-buds for seeds, fluttering airily around them or clinging on like tits, is a delightful thing to watch. In this typical setting it makes a picture of the most exquisite composition' which painters love to depict. In breeding season these birds sing a song or a sort of chorus which is a 'pleasant twittering of considerable range and variations'.

5. **THE HIMALAYAN GREENFINCH**
   Hypacanthis spinoides Vigors
   Salim Ali HB p. 108, plate 40 between pages 84-85
   Remark: The Greenfinches are high Himalayan forest birds; gregarious in habit, they invade the hill station gardens (6,000 to 8,000 feet). 'The green-and-yellow colour scheme of their plumage blends admirably with sunflowers.' They frequent openly forested hillsides with deodar, fir and pine and are found up to the limit of tree growth. They have 'soft twittering call notes' similar to those of goldfinches. In breeding season the male sings a pretty little song, and a flock of them on the wing, 'glinting in the sun against a background of dark green deodars, presents a charming spectacle.'

### THE BUNTINGS

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### genera and species:

1. **THE MEADOW BUNTING**
   Emberiza cia Linnaeus
   Salim Ali HB p. 111, plate 40 between pages 84-85
   Call: a mousy swip, swip
   
   Remark: In summer, the race 'stracheyi' is found from Kashmir to Kumaon between 4,000 and 11,000 feet; in winter, a large part of North India is its home. The bird prefers 'open grassy glades within or on the outskirts of spruce and deodar forest.' Its song, 'not often heard, is said to be short but quite pretty, resembling that of the goldfinch.'
2. **THE WHITE-CAPPED BUNTING**
   Emberiza stewarti
   
   **Remark**: This is another common bird of the Himalayas which differs a little from the one above. In summer it is found between 4,000 and 10,000 feet and in winter it visits the north Indian plains.

3. **THE CRESTED BUNTING**
   Melophas lathami Gray
   
   Salim Ali HB p. 112, plate 40 between pages 84-85
   
   **Call**: pink, pink.
   
   **Remark**: In the Himalayas, this Bunting is found in summer from Kashmir to Assam at moderate levels (up to about 6,000 feet). A dweller of open country, it is fond of old forest clearings overgrown with tall, coarse grass and dhak scrub (Butea). ... Ancient overgrown hill forts with their tumble-down ramparts form attractive haunts. As the breeding season advances the male excitedly sings an Indian Robin type of song which consists of several pleasant notes and invariably starts with a subdued double which — which ... which, which—whee-whee-which.

**REFERENCES**


3. ibid., p. 1 : 26

4. ibid., p. 3 : 124

5. ibid., pp. 3 : 43 - 44

6. ibid., pp. 3 : 18 - 24


PART IV
GLIMPSES
OF
OLD KUMAON
Fragrant flowers
Fond memories —
Pure and sweet
Leave lasting fragrance
All around
For a lifetime

This is divinity
At its best *

* By the author
In the first part I have described my mother’s pilgrimage to the holy Garhwal Himalayas. I cannot describe Kumaon because we have not visited it. Thus, I have to choose from others’ travelogues and have selected descriptions of old treks from these which give a correct impression of the Himalayas when Kumaon was not spoilt by man. These narrations help the present-day travellers to compare and judge what they miss today. The men who trekked during the early European settlement were hardy travellers or mountaineers and possessed a keen sense of perception. Their descriptions are beautiful and deserve careful reading. Obviously, I cannot copy down whole books, and excerpts are bound to be disjointed and incomplete.

Trek from Naini Tal to Almora

"Leaving the valley of the lake, after a few miles of ascents and descents we reach the pass over the Gagar range, the highest point we shall have to surmount in our journey, and having an altitude of nearly 8,000 feet. As we mount upwards to the pass the chir or pine tree (Pinus longifolia), with its long feathery tufts of leaves, give place to thick shady ilex (Quercus dilatata) and giant rhododendron, which in its season is clothed with magnificent red flowers. A Himalayan rhododendron forest in full bloom is a sight never to be forgotten. Above 7,000 feet the vegetation of the Kumaon hills seems to be chiefly oak and rhododendron, and the great dampness of the climate during the rainy season (July to October) causes the gnarled spreading branches of the oaks to be covered with a wonderful growth of ferns, mosses, and delicate creepers."  

"Our day’s travel is diverted here and there by the sight of the monkeys, running up the stems at our approach, or breaking away in droves over the tops of the trees with a crashing noise. The monkeys are of two kinds in the Himalaya — the large long-tailed Langur with whitish body and round black face surrounded by a heavy beard ... and the little brown monkey with its young ones clinging to its back or sides as it swings out of the way and scrambles up its 'family tree'."

"In clear weather there is a magnificent view of the snowy range ... From September to March the peaks are usually visible. I shall never forget the impression of this scene for the first time, as I stood here on a clear, bright day in November 1888, and beheld the 'snowy summits old in story', soaring upwards from the shadows of the dark gorges at their feet — a fairy unsubstantial scene, a glory of delicate shade and colour, which one could hardly recognise as solid reality."

"... Such forests as this are the home of many wild animals; the 'khakar' or barking deer, a beautiful slender-limbed creature, the 'gurral' or Indian chamois, the wild boar, and occasionally a bear or leopard, not to mention the Himalayan partridge ('chakor'), and pheasants of different kinds, the finest of which is the 'monal', with its splendid blue tints, perhaps the most beautiful of birds."

"Nestling among the lower spurs of the great Himalaya, and surrounded by range of higher mountains fading into the blue distance, is the town of Almora. ... Far away to the North stands out the wonderful line of snowy peaks, towering up into the sky to a height of 25,000 feet and showing their well-defined peaks — the sharp wedge of Nanda Devi ... Trisul ... Panch Chulli ...; and on the western extremity the square mass of Badrinath."

"The town lies along the ridge of a hill a little over 5,000 feet above sea-level, and surrounded on three sides by deep valleys through which flow small rivers, the Sual and the Kosi, that go ultimately to join the Ganges."
"The 'rains' in Almora are more endurable than in most other hill-stations, owing to the scarcity of the rainfall ... Naini Tal only thirty miles distant ... the average annual rainfall there being ninety inches as compared with thirty at Almora."

Trek from Almora to Pindari Glacier via Bageswar

"Leaving Almora ... we proceed onwards under the pine-clad height of Hiradungi ... We now ascend the gradual slope of the Kalimatiya hill ..."

"... A more prosaic explanation of the name of the hill, which means 'black earth' ... is that it is owing to the presence of graphite or plumbage.

"The view on either side of this high ridge is grand beyond description. To the westward and southward stretch the deep valleys of the Kosi and its tributaries, opening out from the low plain of Hawalbagh, and the vast panorama is closed in on all sides by noble forest-clad ranges of mountains, many of which are over 10,000 feet high ... On the other side, to the north, is a view of the snowy range, which Sir John Strachey has described as one of the finest to be obtained anywhere, rising above and beyond the dark oak-forests of Binsar. The road from this point turns northward and passes under the slope of the Binsar range, through thick forest, until it reaches a river valley, and then again begins to ascend ...

"A long and very steep descent through grand pine-forest takes us down to the valley of the Sarju, and after traversing the level valley for about two miles we reach Bageswar ... the last outpost of civilization ...

"Bageswar lies in a low valley, and in summer is so hot and unwholesome that ... the inhabitants migrate to more salubrious places.

"From Bageswar we travel for several miles up the right bank of the Sarju, at first along a road shaded by bamboos and semi-tropical vegetation, for the valley is low and hot, but afterwards among the usual pines and hazels and maples. The river valley is flanked on both sides by steep heights, which at times descend close above the stream, at other times retire ... After following the river for about fourteen miles we reach the village of Kapkot ... Round about here considerable game is to be found ... Goral or Himalayan chamois: Kakar, a kind of antelope; and a little farther, at Dhankuri, the splendid monal pheasants, are found. The Sarju River, especially near Bageswar, abounds in mahseer or Indian Salmon ...

"Our next day's march is through fine forest and mountain scenery to Lwarkhet ... where we spend the night ... and arrive at Dhankuri, 10,500 feet, at the top of a high range facing the snows, and justly famed for its magnificent views of the snowy range, which here stand out in their full height and grandeur, without any obstacle between them and the eye of the beholder. The little dak bungalow stands among fine forest not far from the summit, in truly Alpine scenery and climate. The great ridge on which it is placed is a watershed running down from the towering mass of Nanda Devi (over 25,600 feet), and dividing the streams which flow into the Ganges westward from those which feed the Sarda and Gogra eastward, and only reach Ganges at Patna, a thousand miles distant. The site of the Pindari glacier, with its river, the Pindar, forming a dark line below it, can be seen from here. The scene is almost terrible in its frowning height and bewildering vastness..."
"The glacier is about twelve miles from here, in the midst of glorious scenery. The lofty hill of Dhankuri is covered with forests of oak, cypress and rhododendron and carpeted with every variety of flowers, ferns, and mosses, and abounding with wild strawberries, of which we have lately eaten gallons. The view from the top of the range is as a rule visible only in the early morning, as during the day clouds invariably collect and conceal the higher summits. From this place we descended into the valley of the Pindar river, which the road now follows up to its source in the glacier ..."\(^{15}\)

"The Pindar is a glorious river, filling the whole gorge with its roar. There are waterfalls over the cliffs above the river, some of which are over 400 feet in height, and can be seen far aloft falling over still higher precipices — in some cases the whole cascade with its various leaps being not less than 1200 feet in perpendicular descent. The mountain scenery as we approached the snows was simply stupendous — no other word can describe it. From the river-bed we looked up to mountains rising sheer from the bank to a height of 8000 feet above the river, and 16,000 above sea-level, clothed with forest halfway, and ending at the top in terrific battlements and walls of bare rock. Then above all this, glimpses of the snowy peaks soaring into the very zenith, as it seemed, at a height of 25,000 feet. But words and figures can give no idea of the glories of such a scene. They are truly 'the wonderful works of God,' and among the grandest sights on the earth."\(^{16}\)

"Descending the mountain from Dhankuri ... wild boars ... a favourite haunt of bears ... At Khali, some ten miles from the glacier, we met with a heavy shower of hail ...\(^{17,18}\)

"The next day we reached the travellers' lodge at Dwali, beautifully situated at the junction of the Kaphini with the Pindar, on a rising knoll with a raging torrent on either hand ... Here we were at an elevation of over 8000 feet, with great mountains to right and left, clothed with dense forest except on the left side, where the mountain-sides are so steep that hardly anything can find foothold. On that side are numerous waterfalls, some of them descending from rock to rock for over 1000 feet. Words cannot describe the grandeur of these towering fortresses of rocks, clothed as they now are with the loveliest verdure, and adorned with foaming cascades and lightly spraying waterfalls, some of which seem to disappear in mid-air and form again lower down the mountain-side. The vegetation is wonderful; every variety of tree and plant seeming to grow at one elevation or another, in successive zones. Maiden-hair ferns of the finest species grow in fronds of a foot long. Oak, pine, cypress, yew, rhododendron, laurel, holly, ivy, innumerable creepers and ferns and mosses, blackberries, wild strawberries, red currants of very large size, chestnuts, walnuts, maples, rowans, birches, hazels, Scotch thistles, strange fruits and flowers of which none of us know the names, are seen on every hand."\(^{19}\)

**Trek from Kathgodam to Baughdiar**

"From railhead at Kathgodam we made three marches over wooded foothills to Almora. Every morning, before the clouds rolled up, was the vision of the Snows, incredibly vast though still seventy miles away, and the Brochelers were jerked out of the outward phlegm of the alpine peasant by the beauty of the scene. Our way was enlivened by birds they had never seen before: the most exquisite was the Paradise Flycatcher (Terpsiphone paradisi) which the man called the ribband bird. The cock has the two central tail feathers lengthened into white streamers some eight inches long which were in the air behind it like floating ribbands."\(^{20}\)
"On May 14th I left Almora ... Our first stage was a Forest Department bungalow set amid scarlet flowered rhododendron trees on the hill of Binsar, whence from a distance of sixty miles we got our first good sight of the two peaks of Nanda Devi towering over their invariable ramparts of ice ... We saw yellow-billed blue and white magpies (Urocissa sp.) and black drongos with racquet tails, bulbuls, Indian cuckoos and green fruit-pigeons. Flights of entrancing butterflies thronged our path. Near the fields lurked troops of shaggy grey langoors, the big monkey of hills ... on the higher ridges pine forests appeared. The silver fir, raga (Picea webbiana), is the most beautiful of these, growing in close stands like the masts of ships."21

"Perhaps the finest march of all is that between ... Lelam and Baughdiar through the gorge of the Gori river ... In the recesses between the cliffs were thickets of Himalayan oak, trees of rhododendron and box, with stands of dwarf bamboo. On the crags above were thar, short-horned long haired wild goats, desperate climbers and lovers of precipices. We met monal (Lophophorus refulgens), the big peacock-coloured hill pheasant, shooting overhead like a rocketing Capercaillie, and in place of tropical birds we met the white-capped redstart (Chimarrhorris leucocephalus) beside the waters and heard the European cuckoo."22

"... as food was hard to come by ... was itching to get a shot at the burrehal (Ovis nahrina) the 'blue' sheep, we had seen ..."23

Trek from Almora to Bhyundar Khanta (The Valley of Flowers) via the Kauri pass

"We met at Almora on April 24th 1907 ... we climbed up to Gwaldam on the edge of Garhwal where from the terrace of Nash's bungalow, is the finest of all views of the Garhwal peaks, twenty miles away above a succession of wooded foothills. One need go no farther. The unearthly splendour of the snows, before dawn has brought them to life, is incredible ... I remember at Gwaldam a rare tropical sunset ..."24

"These valleys of the Middle Hills are well timbered. Glowing tree-rhododendrons alternate with Himalayan oak and coniferous forests. The open stands of high branching chir (Pinus longifolia) of the lower levels are rather dull — serried ranks of bare stem completely devoid of undergrowth, but higher up is coniferous forest of silver fir, spruce, blue pine and deodar — 'timber of the gods' —. The southward-facing slopes of the higher ridges are frequently bare; but the northern slopes, where the protecting snow-cover remains to the end of spring are well wooded. Here the native chestnut was coming into leaf and white anemones were opening. Above precipices, tuckled away safe from the depredations of sheep and goats, there are woods of silver birch like those of the Highlands, with birds and butterflies of familiar northern form. Still higher, the flora becomes arctic until finally the landscape undergoes its last transformation, into polar desert. In the deep cut gorges of Garhwal, all the gradual changes which spread from the tropics to the pole are telescoped into a few miles, so that we may see them disposed vertically up the side of a single valley and realize that high altitude is a biological equivalent of high latitude."25

"On May 8th, ..., we crossed the Kauri Pass, 12,400 feet, still under snow. We climbed a little hill above the pass and gained a most impressive view of the Kamet group to the north, a galaxy of peaks divided by a maze of glaciers ... To the east Dunagiri soared up from the northern rim of the Nanda Devi rampart, and away to the west was lovely Nilkanta, the Blue Spike, and the broad bastion
of snow set above black cliffs over sacred Kedarnath. We descended through deodar forest to the banks of the Dhagali river, a tumult of glacier water and melting snow, and snow, and so to Tapoban."

"The toils, the fatigues and the discomforts of the entire journey were repaid a thousand times by the visions of the next two days that we spent exploring the Lata ridge at about 15,000 feet. The prospect surpassed my wildest imagination. We could see into the depths and up the whole length of the Rishi nullah while above the inviolate upper gorge towered Nanda Devi, seen in full majesty, 'remote, serene and inaccessible'."

"Amidst this ineffable scene I saw to my astonishment a pure white falcon, whiter than any I was afterwards to see in the Arctic, sailing like a peregrine in the thin blue air. The beautiful monal, grandest of all Himalayan pheasants, we flushed constantly, and there were many big sturdy snow pigeons (Columba leuconota) about. In the snow we came across signs of musk-deer."

"... no supplies to be had ... I went up a side nullah and got four thar, the long-haired short-horned wild goat. I count this as the most sporting animal in the Himalaya. It lives on far worse ground than any other beast, frequenting the very steepest cliffs about and above the tree line ... So on May 31st ... I hit the trail once more ... Above the hamlet of Tolma the forest is gorgeous and we passed one colossal deodar which measured forty-one feet around the bole, six feet above the ground. In the higher woods numbers of monal pheasants were nesting."

"On June 2nd we raced down to the fairy meadow of Dibrugheta ... Dibrugheta is a fragment of Arcady dropped amid chaos; a very paradise where we could listen to cuckoos and willow warblers [P. affinis (Tickell)] singing, while flaming redstarts displayed by the margin of the little pine forest which half encircled the meadow, as though defending us with a friendly screen from the appalling cliffs immediately below."

"... there was a path, visible, care-free, with flowers springing beside. It was a day of sunlit splendour without a cloud, with no wind, and warm. Around me every peak and glem stood out absolutely clear. On my right hand was Dunagiri, ravishingly beautiful in form; up the gorge of the Rishi every detail of giant Nanda Devi was revealed. The entire ring of mountains to the south sparkled as if dusted with a myriad diamonds and like diamonds they seemed to give forth their own light. To my left I looked down into the profundity of the lower gorge of the Rishi. Impending unbelievably high above the abyss, seeming to float in the sky, were the distant peaks over Badrinath, whither we were ultimately bound. Such was my last vision by far the loveliest region of the whole Himalaya."

"On July 11th we started off for ... Bhyundar Khanta. Though only 16,700 feet it is a magnificent passage, a glacier depression immediately between two peaks of over 20,000 feet. The one on our left, Rataban (20,100 feet), a symmetrical peak of snow and ice with a sharp rocky summit, tempted as strangely, but we had no time for dallying. From the summit of the pass we looked down on to a series of glaciers ... They fall, very steeply at first, from Rataban and Gauri Parbat (22,027 feet). These peaks, together with Hathi Parbat (22,070 feet) make the magnificent southern terminal of the rather dull Kamesh massif ... Beyond these glaciers we looked down into a valley of the richest green, balm to the eyes after the stony desolation we had left behind. We reached it on July 13th to find
the most luxuriant meadows we had met with in this part of the Himalaya. We waded through flowers up to our waists — ferns, yellow lilies and anemones, green fritillaries, purple monkshood, blue dwarf iris, masses of forget-me-not with yellow kingcups by the streams. Innumerable butterflies of alpine forms, including at least two species of large swallow-tails, with many singing birds, were about us on all sides ... The charms of the place were so irresistible that we spent a whole day there."

REFERENCES

1. E. Sherman Oakley, Holy Himalaya, Oliphant Anderson and Ferrier, London, 1905, p. 32
2. ibid.
3. ibid., p. 34
4. ibid.
5. ibid., p. 36
6. ibid., p. 37
7. ibid., p. 38
8. ibid., p. 62
9. ibid., p. 63
10. ibid., p. 64
11. ibid., p. 66
12. ibid., p. 60
13. ibid., p. 67
14. ibid., p. 69
15. ibid., p. 70
16. ibid., p. 71
17. ibid., p. 70
18. ibid.
19. ibid., p. 72
20. T.G. Longstaff, This My Voyage, John Murray, London, 1950, p. 68
21. ibid., pp. 69-70
22. ibid., p. 71
23. ibid., p. 72
24. ibid., p. 85
25. ibid., pp. 87-88
26. ibid., p. 89
27. ibid., p. 90
28. ibid.
29. ibid., p. 97
30. ibid., p. 98
31. ibid., p. 107

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BIBLIOGRAPHY

A. BOOKS

1. Abode of Snows by A. Wilson
   
   This is an old book on the Himalayas which I have seen once and do not claim to have read it through.

   
   Some chapters of this Gazetteer are reprinted recently under the title:

   Geology of the Himalayas by E. T. Atkinson, Cosmo Publication, New Delhi, India, 1980
   
   This is one publication which gives information about Uttarakhand and its adjoining territory. The author of the present book has relied on it heavily. The book is an old one and information contained in it is more than a century old. Its value is in its usefulness as a book of old records. It gives us some idea of how the Himalayas looked when the Britshers arrived in this country.

   
   This is a general book on India and is not on the Himalayas. It contains a chapter on the topography of India and here, in a section, Strachey, one of the able administrators of British India, and the one who in his early career was posted in Kumaon and Garhwal wrote of his impression of the region.

4. Holy Himalaya by E. Sherman Oakley, Oliphant Anderson and Ferrier, Edinburgh and London, 1905
   
   Here is an interesting travelogue by Oakley. He travelled through Kumaon and Garhwal during the early British settlement (1885). His account is useful today to compare the present condition of this region with that of bygone days.

5. A Sketch of the Geology and Geography of Himalayan Mountains and Tibet by S. G. Burrard and H. H. Hayden (1907)
   
   A revised edition of the book with A. M. Heron as the third joint author was published by the Government of India, Delhi, in 1933. Recently, a reprint of the 1907 work (and not of the 1933 edition) has appeared with the following title:

   Geography and Geology of Himalayan Mountains and Tibet by S. G. Burrard and H. H. Hayden, Gian Publication, Delhi, 1980
   
   As a first scientific work the book had its own place. However, the revised edition of 1933 did not satisfy its readers. Unfortunately, another work of this magnitude has not appeared since then and it still remains an indispensable guide to all the students of geography and geology. I give below some opinions of geographers.

   'On the Himalayas, the standard work of a sort is S. G. Burrard, H. H. Hayden, and A. M. Heron, A Sketch of the Geology and Geography of the Himalayan Mountains and Tibet (Govt. of India, 2nd edn., 1933) — an indispensable mine of factual detail but exceedingly badly arranged and in places much less than scientific; such criticism might seem presumptuous from a critic who has never penetrated beyond Simla, but the curious reader is referred to K. Mason's review in The Himalayan Journal, 7 (1935), 113-24, a critique equally authoritative and amusing. This journal contains a wealth of papers on Himalayan topics.' (Spate and Learmonth, p. 45, 1957)
Excerpt from Mason’s review: ‘The authors of the revision have handicapped themselves by following the pattern of the first edition... such an arrangement was suitable to the earlier state of our knowledge but the time has come when Himalayan geographers must understand the general structure of the mountains before attempting to describe their geography... For this reason a complete rearrangement would have been preferable, with the structural sections written afresh... so that the geography could have been built soundly on such a foundation... It may seem ungenerous to criticize a work that has taken so much time and labour...’

‘It is regrettable that, except for Heron’s geological contributions, the official Sketch of the Geography and Geology of the Himalayan Mountains and Tibet (Hayden, Burrard, and Heron, n.d., 2nd edn., 1933) shows a less than modest acquaintance with modern geographical ideas, and, while it contains an immense mass of facts, is perhaps the most incoherent scientific work ever put out by authorities of repute.’ (Spate, Learmonth and Farmer, p. 450, 1967)


‘... the District Gazetteers (various dates). Despite their age the Gazetteers are still of much use, though the District volumes, on which the others are based, are very unequal, indeed, excellent or the reverse according to the conscience, enthusiasm, and ability of the local District Commissioners. They have been at once a blessing and curse to Indian geographers...’ (Spate and Learmonth p. 11, 1957)


This is a Gazetteer written by Indians after independence. In it they have tried to do justice to India. How far they have succeeded in this noble objective I cannot say. Nor I have others’ comments. The volume that concerns us is the first. In it there are some chapters which are of use to us. These are on physiography and on flora and fauna. They are written by eminent Indian scientists.


This is a book for explorers. The author was the first man to penetrate the inner sanctuary of the Nanda Devi mountains and the book is famous for the account of it. For us the most fascinating part of the book is his narration of the trek from Badrinath to kedarnath (actually Madhmaheshwar). It also contains some excellent photographs. That of the Sundardhunga forest is of relevance to us.


Tilman was Shipton’s companion when they explored the Nanda Devi region. Later, he led an expedition to the mountain and climbed it. This is an account of it and is of interest to mountaineers. To us, photographs give the topography of the region.


Heim and Gansser came to India as geologists. Their expedition was scientific. This book is a popular account of it. It contains more than 200 photographs of mountains and scenery. The spreads give panoramic views of mountain ranges. The region covered is mainly that of Kumaon and Garhwal although it touches upon Western Nepal and Tibet.

11. Central Himalaya: Geological Observation of the Swiss Expedition 1936 by Arnold Heim and Augusto Gansser, Gebrüder Fretz, Zurich, 1939

A reprint is recently published by Hindustan Publishing Corporation (India), 1975

In this book are collected the geological results of the above expedition. It is primarily of interest to geologists and laymen may not understand it.

Gansser gives his own scientific account of the above expedition in this book. It contains beautiful drawings and the spreads are marvellous. We have already made use of them and readers can judge themselves.


Maps and spreads from the above book are collected separately and are placed in a jacket for independent sale.


A day-to-day record of Smythe's expedition to Kamet is given in this book. It contains a chapter on the Valley of Flowers. Photographs of mountains acquaint us with various peaks of the region. At the end of the book there is a botanical note by R. L. Holdsworth which gives information on the flowers of Uttarakhand and of the Himalayas.

15. The Valley of Flowers by Frank S. Smythe, Hodder and Stoughton Limited, London, 1947

This is a book for those who love flowers and meadows. It describes the scenery of the Valley of Flowers in good detail. Colour-photographs are excellent. Facing page 101 is the Queen of Himalayan flowers, the blue poppy (Meconopsis aculeata). The other notable plates are the Khanta Khal pass (facing p. 108) and the summit of Gauri Parbat at sunset (facing p. 140). Appendices (p. 289 onwards) contain two botanical notes — plants collected in 1937 from the Bhynder Valley and Neighbourhood and supplementary list of plants collected in 1931 by R. L. Holdsworth in the Bhynder Valley and Upper Garhwal.

16. This My Voyage by Tom Longstaff, John Murray, London, 1950

The book is famous for Longstaff's ascent on Tisul in 1907. It also contains his exploration of the Himalayas. His early maps — Rishi Valley (p. 66); East side of Nanda Devi (p. 70); Garhwal South (p. 86); Garhwal North (p. 106); Nepal (p. 142); Eastern Karakoram (p. 162); Saltoro pass (p. 168) and Hindu Kush (p. 194) — are good and have proved very useful to me. His graphic description of all these places is equally good.


Murray, a writer as well as a mountaineer, was the leader of this expedition. His team explored a vast region between the Bethartoli Himal mountain and the Girthi river. They climbed a few peaks but their journeys through the Himalayas were extensive. Murray's skill as a writer is evident throughout the book. Starting from Rishikesh, the team crossed the famous Kuari pass and went on to the Rishi gorge. They climbed the Bethartoli Himal mountain and made their way on to the Girthi region. From here to the Ralam pass and to the Panch Chuli hills and back to Almora is a very very long way — a rewarding one too. All these excursions come under Murray's pen and the reader is delighted. The sketch of the Nanda Devi block and the Panch Chuli hills on the opening and the end covers is marvellous. We have used it.


Weir was one of the members of the above Scottish expedition. He wrote his account from a mountaineer's point of view and covered the technical aspect of their joint exploration.

Mason was the editor of the Himalayan Journal for a long time and came to be regarded as an authority on the Himalayas. In this book the history of Himalayan exploration is covered right from the beginning to the year 1953. The work is a veritable mine of information and the present author has relied on it fully. The heights of the Himalayan mountains are always subject to correction and Mason had paid due attention to them. I have used his figures for all the mountains of the Great Himalayas except for those of Uttarakhand because the survey maps of foreign countries like Nepal, Bhutan were not available to me. Of course, Mason's work is outdated today, but I saw no point in using the presently accepted heights for a few mountains, and the older ones for most others. If I had done so then a hop-step view of the entire range would have manifested. Unfortunately, no authoritative work on the Himalayas with the recent data from all the concerned countries is available and hence Mason's book still remains the only authoritative record on the Great Himalayas.

20. **Trekking in Lower Himalaya**, issued on behalf of Department of Tourism, Ministry of Transport and Communications, Government of India, New Delhi, 1960

   This is a book for tourists and trekkers. It contains a trek to the Pindari glacier, a few in the state of Himachal Pradesh and some interstate ones.


   A book specifically meant for pilgrims. It contains information on Jomnatri, Gangotri, Kedarnath and Badrinath. I have used one of its photographs to make a sketch.


   There are 19 chapters in this book which are written by as many authors. The articles are on all aspects of the Himalayas, namely, exploration, mountain climbing, mountaineering institutes of India, biographies of Jayal and Tensing, alpine gardening, hill birds and butterflies, fauna, and rivers of ice. The colour plates of Nanda Devi and the great dome of Nokanta are noteworthy. Facing page 125 are colour insets of four Himalayan flowers — *Fritillaria oxypetala* at 12,500 feet, the large rock anemone (*Paraquilegia grandiflora*) at 15,200 feet, the blue poppy (*Meconopsis aculeata*) at 13,500 feet and the famous Rhododendron tree in the eastern Nepal (7,000 to 10,000 feet).

23. **Bhutan — A Physical and Cultural Geography** by Pradyumna P. Karan, University of Kentucky Press, Lexington, 1967

   Bhutan is almost an unknown country and it is heartening to see a well-produced book of geography on it. It contains an excellent large map of Bhutan which will be extremely useful to every student of the Himalayas.


   This is an atlas as well as a book on mountaineering and covers all the mountains of the world. There are several chapters on the Himalayas. Each section contains an excellent map and good photographs of some prominent peaks. The text mainly deals with the history of exploration.


   A great album on the Himalayas, it contains remarkable photographs of great peaks. It is a visual treat.

The book contains several chapters on the Himalayas. The one on Kumaon and Garhwal is on
page 78. It gives the author's account of the Swiss expedition to Gangotri region in 1947. Braham
among others was the one who travelled from Gangotri to Badrinath via the Kalindini pass. It contains
a good map of the region but is marred by a few mistakes.

27. Ganga — Sacred River of India, photographs by Raghubir Singh, text by Eric Newby, the Perennial
Press, Hong Kong, 1974

This is a great album on Ganga and contains some remarkable photographs of the river, right
from its source to its delta in the Bay of Bengal. The peak of Shivling near the snout of Gangotri
glacier is conspicuous for its beautiful shape. It also shows the rugged terrain of the glacier.

28. Himalayas, photographs and text by Yoshikazu Shirakawa, originally published in 1976 by Harry N.

This is one more book having many photographs of the Himalayas. It represents all the sections
of the Great Himalayas and the photographs are excellent. Some sections contain good maps and
these prove very useful. The text is kept to a bare minimum.

29. The Himalayas by Navnit Parekh, India Book House Private Limited, Bombay, 1977

A guide book for tourists.

30. In the Throne Room of the Mountain Gods by Galen Rowell, George Allen and Unwin Limited, London,
1977

A beautifully produced book which mainly deals with the Karakoram range. It contains excellent
photographs which do justice to these magnificent mountains and glaciers. A print of the Snow Leopard
reveals its beauty.

House Private Limited, New Delhi, 1978

An informative book.


For visual treat this book is superb and everyone should see it once. Practically the whole range
of Himalayas is represented by very good photographs.

33. Stones of Silence — Journeys in the Himalaya by George B. Schaller, Andre Deutsch Limited, London
and Vikas Publishing House Private Limited, New Delhi, 1980

On the opening and the end covers are the head-sketches of such diverse Himalayan animals
as ghooral, ibex, markhor, nayan and others. It also contains some good photographs.

34. The Himalaya — Aspects of Change edited by J. S. Lall, India International Centre, New Delhi, and
Oxford University Press, India, 1981

This is a technical book. For laymen it is difficult to read. It contains articles by 27 eminent
men of India and deals with 'Nature, Man and Interrelationships'. It covers climate, bird life, fauna,
flora, geology, glaciology, earthquakes, soils and water resources. It gives an 'authoritative assessment
of the ecological dangers inherent in the changes caused by tourism, industrial and economic
development'.

This book is the author's account of the Pindari glacier which he visited twice — once in 1939 and again in 1943. The writer was then a high government official in Kumaon. It is rather strange that he published his travels only in 1970. The usefulness of the book lies now in comparing the present day Pindari trek with that of distant days.


A well-known textbook, it deals with the geography of the Indian subcontinent. Discussion on the Himalayas comes in naturally as a part of the structural geography of the region. It contains very useful technical information on several aspects of the Himalayas and I have benefited by it. Page 32 and the sectional chapters on the Himalayas are of use to us.

37. India — A Regional Geography edited by R. L. Singh, Silver Jubilee Publication of the National Geographical Society of India, Varanasi, 1971

Books on the geography of India are rare and still rarer are such books by Indian authors. Perhaps, this is the only book on Indian geography by Indians and I have relied on it whenever I could not find an alternative source. I have drawn the sectional maps of Kashmir, Himachal Pradesh and Uttarakhand with the help of this book. Unfortunately, this massive book is written incoherently and the overall production is shabby. Had it been otherwise, this book would have become an exceptional and excellent treatise on Indian Geography.

38. Geography of Uttar Pradesh by A. R. Tiwari, National Book Trust, New Delhi, 1971

This is the only textbook on the geography of Uttar Pradesh and hence its usefulness is worthy of note.

39. This Beautiful India : Uttar Pradesh by Sukhdev Singh Chib, Light and Life Publications, New Delhi, 1978

Chib has written books on many parts of India and this is one of them. It is a hastily written book and is meant for tourists.


A well-known textbook on the geology of India, it is used in the Indian universities as a source book.

41. Geology of India and Burma by M. S. Krishnan, Higginbothams Limited, Madras, 1968

This is one more University textbook on the geology of India and Burra’s famous map of the Himalayas is on p. 11.


This book deals with the trees of England, however, it gives good account of a few Himalayan trees which were introduced way back in U. K.


The world’s wildlife is well portrayed in this book and Indian animals and trees do find their due place in the relevant chapters. Excellent photographs enrich the work considerably.

This is the only authoritative book on Indian mammals and I have fully relied on it. My gratitude to the author is expressed on every page of the section on fauna of my book.


Gee was on the board of the Wild Life of India and he visited various wildlife sanctuaries of India as a matter of routine. The book is his account of these visits.

46. *India — Wildlife* by M. Krishnan, the Department of Tourism, Government of India, New Delhi. (Not for sale, January 1977)

Krishnan was awarded the Jawaharlal Nehru Fellowship to study the mammals of India. He visited all the major sanctuaries of India and photographed these animals. The present pamphlet which shows these photographs is the result.

47. *Man-Eaters of India* by Jim Corbett, Oxford University Press, New York, 1957

*Man-Eaters of Kumaon*

Copyright 1946 by Oxford University Press, Inc.
First published in India, 1944

*The Man-Eating Leopard of Rudraprayag*

Copyright 1948 by Oxford University Press, Inc.
First published in India, 1947

*The Temple Tiger and More Man-Eaters of Kumaon*

Copyright 1954 by Oxford University Press, Inc.

This book is as famous as its author. It deals with the wildlife of Uttarakhand which is the main theme of my book and hence it would serve as an additional reading material.


Salim Ali is the only Indian author of Indian birds and every one is indebted to him. The book was first published in 1941 and the present edition (1979) is the 11th one. The book has gone through several revisions; however, the 8th edition showed the major change. The author in that edition reclassified and rearranged the book according to S. Dhillon Ripley's new scheme.


This book contains some 217 birds of the western Himalayas which I have listed in a different order in my book.

52. *Flowers of the Himalaya* by Oleg Polunin and Adam Stainton, Oxford University Press, Delhi, 1984

This is the first book on Himalayan flowers. I am pleased to see it.


A Japanese book, the text is in Japanese. One can see beautiful photographs of flowers.

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54. Living Himalayan Flowers by Sasuke Nakao, The Mainichi Newspapers, Tokyo, Japan, 1964
   Comment as on 53.

55. Indian Wildlife, Text by Ramesh Bedi, Photographs by Rajesh Bedi, Brijbasi Printers Private Limited, New Delhi, 1984
   This is the first book on the wildlife of India which is really good. The author and the photographer have tried their level best to do justice to the subject. Congratulations!

56. Geography of the Himalaya by S. C. Bose, National Book Trust, India, New Delhi, 1972

B. ARTICLES

1. 'Nanda Devi and the Sources of the Ganges' by H. W. Tilman, Himalayan Journal 7, 1, 1935
   Shipton and Tilman explored the inner sanctuary of Nanda Devi and Tilman’s account of it is recorded here. From our point of view the cross-country run from Badrinath to Kedarnath (actually Madhmaheshwar) is the most interesting part of the article. Among the contents, the spreads and photographs — the inner sanctuary of Nanda Devi, the Bhagat Kharak glacier and the Sundardhunga valley — are worth consulting.

   This is a review of the book — A Sketch of the Geography and Geology of the Himalayan Mountains and Tibet by Colonel S. G. Burrard and H. H. Hayden; revised by Colonel Sir Sidney Burrard and A. M. Heron, Delhi: Manager of Publications.

3. 'An Excursion to Gangotri' by J. B. Auden, Himalayan Journal 8, 96, 1936
   Information contained in this article is only of historical interest now. Auden used old maps which are outdated and replaced by better ones. The photographs of Satopanth group of mountains and of Sonero Parvat are noteworthy.

4. 'The Ascent of Nanda Devi' by H. W. Tilman, Himalayan Journal, 9, 21, 1937
   This is an account of Tilman’s expedition to Nanda Devi. His book with the same title as the one above gives a fuller account of it and supersedes this article. Two photographs of Rishi Ganga are worth seeing.

5. 'Structural Studies in the Central Himalaya, 1936' by Arnold Heim, Himalayan Journal, 9, 39, 1937
   A technical article of use to geologists and other research workers. It contains good photographs of Nilkanta and Badrinath.

6. 'Survey Work in the Nanda Devi Region' by Eric Shipton, Himalayan Journal, 9, 74, 1937
   Shipton’s book on Nanda Devi supersedes this article. It contains good photographs of Shark’s Tooth, Changabang, Trisul, Dunagiri, Nanda Devi, Nandakana and others.

7. 'Karakoram Nomenclature' by Kenneth Mason, Himalayan Journal, 10, 86, 1938
   This article gives an exhaustive information on the Karakoram range.
8. 'Across the Gangotri-Alaknanda Watershed' by J. A. K. Martyn, Himalayan Journal, 10, 80, 1938

Martyn and Gibson were among the early explorers to reach the Chaturangi glacier. This article records their adventure.

9. 'Gangotri Triangulation' by Major Gordon Osmaston, Himalayan Journal, 11, 128, 1939

The Survey of India maps are based on works of many surveyors and Osmaston was one of them. He was entrusted with the work in the Gangotri region. His observations are contained in this article. The present-day maps are of 1962-67 period and are based on aerial works.

10. 'The German Expedition to the Gangotri Glacier, 1938' by Professor Rudolf Schwarzgruber, Himalayan Journal, 11, 143, 1939

As the title suggests, this is an account of the German expedition to the Himalayas in 1938. This volume contains good photographs of many mountains around the Gangotri glacier, namely, Shivling, the Bhagirathi peaks, the Vasuki peak, the Swachhand peak, Chandra Parvat, Satopanth, Kharchakund, Kedarnath and Badrinath.

11. 'A Season's Work in the Central Himalaya' by J. B. Auden, Himalayan Journal, 12, 17, 1940

This is an article on the Survey work done by Auden's team between the Bandarpunch and Kamey peaks. It contains some information on the Survey of India maps of his period. Photographs of the Dhauladhar range — Srikantha, Phating Pithwara and others — are of value.


A good description of this remote region of Uttarakhand.

13. 'Dunagiri, Gauri Parbat, Rataban, and Chaukamba, 1939' by Andre Roch, Himalayan Journal, 12, 30, 1940

This is an account of the French expedition to the Himalayas. It contains good photographs of Dunagiri, Nanda Devi, Rataban, Gauri Parvat, Hathi Parvat and Chaukamba.


This is an expedition to climb the Gangotri group of mountains. It contains a good map of the region (see between pages 88-89).

15. 'The Harki Doon' by J. T. M. Gibson, Himalayan Journal, 18, 93, 1954

Gibson took a school expedition to Bandarpunch. This is his account.
C. SURVEY OF INDIA MAPS

The Survey of India makes accurate maps for all regions of the country. As far as the boundary and the topography of India are concerned it is the final authority. For Uttarakhand the following maps cover its topography:

\[
\begin{array}{cccccccc}
53^\text{E} & 575^\text{E} & 555^\text{E} & 535^\text{E} & 533^\text{E} & 532^\text{E} & 531^\text{E} & 530^\text{E} \\
16 & 4 & 8 & 12 & 16 & 8 & 16 & 8 \\
53^\text{F} & 575^\text{F} & 555^\text{F} & 535^\text{F} & 533^\text{F} & 532^\text{F} & 531^\text{F} & 530^\text{F} \\
13 & 1 & 5 & 10 & 13 & 10 & 13 & 10 \\
53^\text{G} & 575^\text{G} & 555^\text{G} & 535^\text{G} & 533^\text{G} & 532^\text{G} & 531^\text{G} & 530^\text{G} \\
14 & 2 & 6 & 10 & 14 & 10 & 14 & 10 \\
53^\text{H} & 575^\text{H} & 555^\text{H} & 535^\text{H} & 533^\text{H} & 532^\text{H} & 531^\text{H} & 530^\text{H} \\
15 & 3 & 7 & 11 & 15 & 11 & 15 & 11 \\
53^\text{I} & 575^\text{I} & 555^\text{I} & 535^\text{I} & 533^\text{I} & 532^\text{I} & 531^\text{I} & 530^\text{I} \\
16 & 8 & 12 & 16 & 12 & 16 & 12 & 16 \\
53^\text{J} & 575^\text{J} & 555^\text{J} & 535^\text{J} & 533^\text{J} & 532^\text{J} & 531^\text{J} & 530^\text{J} \\
13 & 1 & 5 & 10 & 13 & 10 & 13 & 10 \\
53^\text{K} & 575^\text{K} & 555^\text{K} & 535^\text{K} & 533^\text{K} & 532^\text{K} & 531^\text{K} & 530^\text{K} \\
1 & 2 & 6 & 10 & 2 & 6 & 2 & 6 \\
53^\text{L} & 575^\text{L} & 555^\text{L} & 535^\text{L} & 533^\text{L} & 532^\text{L} & 531^\text{L} & 530^\text{L} \\
12 & 5 & 10 & 12 & 5 & 10 & 5 & 10 \\
53^\text{M} & 575^\text{M} & 555^\text{M} & 535^\text{M} & 533^\text{M} & 532^\text{M} & 531^\text{M} & 530^\text{M} \\
8 & 16 & 16 & 8 & 16 & 16 & 8 & 16 \\
53^\text{N} & 575^\text{N} & 555^\text{N} & 535^\text{N} & 533^\text{N} & 532^\text{N} & 531^\text{N} & 530^\text{N} \\
9 & 13 & 13 & 9 & 13 & 13 & 9 & 13 \\
53^\text{O} & 575^\text{O} & 555^\text{O} & 535^\text{O} & 533^\text{O} & 532^\text{O} & 531^\text{O} & 530^\text{O} \\
5 & 10 & 14 & 5 & 10 & 14 & 5 & 10 \\
53^\text{P} & 575^\text{P} & 555^\text{P} & 535^\text{P} & 533^\text{P} & 532^\text{P} & 531^\text{P} & 530^\text{P} \\
7 & 15 & 15 & 7 & 15 & 15 & 7 & 15 \\

Of these, 53\frac{1}{4}, 53\frac{1}{8}, 53\frac{1}{12}, 53\frac{1}{16}, 53\frac{1}{24}, 53\frac{1}{32}, 53\frac{1}{64}, 53\frac{1}{128} were very important for my work but were not available to me. And hence, I have not seen them.

I have consulted the following maps for my work. Their numbers are 53\frac{1}{12}, 53\frac{1}{16}, 53\frac{1}{5}, 53\frac{1}{9}, 53\frac{1}{13}, 53\frac{1}{17}, 53\frac{1}{31}, 53\frac{1}{63}.

The contents of these maps are as under.

KINNAUR DISTRICT (Himachal Pradesh)
and
UTTARKASHI DISTRICT (Uttar Pradesh)

The region was surveyed during 1962-63. The map was issued in 1966. The scale is 1 : 50,000.

| Latitude | 31°, 00' to 31°, 15' |
| Longitude | 78°, 30' to 78°, 45' |

Grid number
97 to 127
40 to 67

The map number in the square depicts the region under consideration and the remaining eight map numbers surrounding it are complementary.
The map contains the Bandarpunch and Swargarohini ranges. The associated glaciers are Jamdar Bhamak, Lamkhaga Bhamak, Ratya Bhamak, Siyan Bhamak, Bartyakhunt Bhamak and Bandarpunch Glacier. A portion of the Bhagirathi river (from Suki to Jhala) is also shown therein.

**KINNAUR DISTRICT (Himachal Pradesh)**

and

**UTTARKASHI DISTRICT (Uttar Pradesh)**

The region was surveyed during 1962. The map was issued in 1967. The scale is 1 : 50,000.

**Grid number**

<table>
<thead>
<tr>
<th>Latitude</th>
<th>31°, 00' to 31°, 15'</th>
<th>100 to 130</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitude</td>
<td>78°, 45' to 79°, 00'</td>
<td>64 to 91</td>
</tr>
</tbody>
</table>

The map covers the region from Harsil to Bhaironghati. The river Bhagirathi and its tributaries are shown. Towns of Jangla, Kapang and Langa are on the bank of the river.

**UTTARKASHI DISTRICT**

The region was surveyed in 1963. The map was issued in 1967. The scale is 1 : 50,000.

**Grid number**

<table>
<thead>
<tr>
<th>Latitude</th>
<th>30°, 45' to 31°, 00'</th>
<th>67 to 98</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitude</td>
<td>78°, 15' to 78°, 30'</td>
<td>19 to 46</td>
</tr>
</tbody>
</table>

The map traces the path of river Jamuna right from Lankichatti to Gangani. Sainachatti comes in between. The region is of dense forests and their names are given therein.

**UTTARKASHI DISTRICT**

The region was surveyed in 1962. The map was issued in 1966. The scale is 1 : 50,000.

**Grid number**

<table>
<thead>
<tr>
<th>Latitude</th>
<th>30°, 45' to 31°, 00'</th>
<th>70 to 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitude</td>
<td>78°, 30' to 78°, 45'</td>
<td>43 to 70</td>
</tr>
</tbody>
</table>

The map traces the path of Bhagirathi river from a place below Suki. Towns of Bhatwari and Gangnani are on its banks. Jakhai Bhamak and Chhaian Bhamak which are south of the Bandarpunch range are shown therein.
TEHRI-GARHWAL
and
UTTARKASHI DISTRICTS

The region was surveyed during 1962-63. The map was issued in 1965. The scale is 1 : 50,000.

Latitude 30°, 45' to 31°, 00'
Longitude 78°, 45' to 79°, 00'

Grid number 72 to 103
67 to 94

The map contains the Gangotri and Jogi groups of mountains. The Dhauladhar range begins from Srikanta and reaches to Phating Pithwar (Thalaiyasagar). Hanuman Tibba, Bhirgu Parvat, Rudugaira are other notable peaks. The glaciers are: Kedar Bamak, Rudugaira Bamak, Dudu Bamak, Joonli Bamak, Jogi Bamak, Ratangariyan Bamak, Khatling Bamak, Bharteekhunta Bamak, Satling Bamak, Dughanga Bamak, Dokriani Bamak, Goni Bamak and Meeha Bamak. The region is south of the Gangotri town and the course of Bhagirathi river is traced.

CHAMOLI, TEHRI-GARHWAL
and
UTTARKASHI DISTRICTS

The region was surveyed in 1962. The map was issued in 1966. The scale is 1 : 50,000.

Grid number 75 to 105
91 to 118

Latitude 30°, 45' to 31°, 00'
Longitude 79°, 00' to 79°, 15'

This is the map of the famous Gangotri glacier. It contains all the renowned peaks — Bhrigupanth, Meru, Shivling, Kirtistambh, Bharteekhunta, Kedar Nath, Mahalaya Parvat, Sumeru Parvat, Kharchakund, Sudarshan Parvat, Mana Parvat, Bhagirathi Parvat, Vasuki Parvat, Satopanth and Chandra Parvat. The associated glaciers are: Matri Bamak, Theju Bamak, Manda Bamak, Bhrigupanth Bamak, Meru Bamak, Kiriti Bamak, Bharteekhunta Bamak, Dughanga Bamak, Chorabani Bamak, Bisal Bamak, Satling Bamak, Ghanohim Bamak, Swachhand Bamak, Gangotri Glacier, Chaturangi Bamak, Vasuki Bamak, Suralaya Bamak, Swetvarna Bamak, Raktvarna Bamak, Nilambar Bamak and Pilapani Bamak.

CHAMOLI
and
UTTARKASHI DISTRICTS

The region was surveyed in 1962. The map was issued in 1966. The scale is 1 : 50,000.

Grid number 77 to 108
14 to 41

Latitude 30°, 45' to 31°, 00'
Longitude 79°, 15' to 79°, 30'

The map contains two well-known peaks — Chaukhamba I and Narayan Parvat. The region around the famous Badrinath temple and the Mana township is made of glaciers — Bhagirath Kharak Bank, Satopanth Bank, Mana Bank, Kalandani Bank, Seta Bank, Luri Bank and Bhagnyu Bank. The rivers Saraswati and Vishnu-
gang (Alaknanda) are shown therein. A portion of the Kamet region covers big and small glaciers — Tara Bank, Balbala Bank, Chamrao Glacier, Dakhini Chamrao Glacier and Paschimi Kamet Glacier. The famous Kalandari Khali (5968 metres) which links the Badrinath and Gangotri regions is found herein.

CHAMOLI, TEHRI-GARHWAL

and

UTTARKASHI DISTRICTS

The region was surveyed in 1962. The map was issued in 1966. The scale is 1 : 50,000.

Grid number

Lat. 30°, 30' to 30°, 45'
Long. 79°, 00' to 79°, 15'

47 to 78

93 to 120

The townships of Kedarnath, Mandani and Madhyamaheshwar are located on this map. The peak of Mandani Parvat is to the north of the Mandani township. The lakes Chorebani Tal, Panya Tal and Vasuki Tal are near Kedarnath. The glacier Mandani Bank is close to the Mandani peak.

CHAMOLI

and

UTTARKASHI DISTRICTS

The region was surveyed in 1923-24 and in 1936-37. The aerial survey was carried out in 1960 and in 1961-62. The map was issued in 1963. The scale is 1 : 50,000.

Grid number

Lat. 30°, 30' to 30°, 45'
Long. 79°, 15' to 79°, 30'

52 to 83

14 to 41

The map depicts the region south of the Chaukhamba I peak. The summits of Chaukhamba II, III, IV and of Nlkanta are on the map. A portion of Satopanth Bank, Panpatia Bank, Puna Bank, Kalapani Bank and Gimme Bank are shown therein. The famous township of Badrinath is in a corner.

CHAMOLI DISTRICT

The region was surveyed in 1962-63. The map was issued in 1963. The scale is 1 : 50,000.

Grid number

Lat. 30°, 30' to 30°, 45'
Long. 79°, 30' to 79°, 45'

52 to 83

41 to 68

This is the map for those who want to visit the Valley of Flowers. The region contains Gauri Parvat and Hati Parvat. The glaciers are Kosa Kumar Bank, Raj Bank, Tipra Bank, Juma Glacier, Goda Bank and Khalar Bank. The townships of Joshimath, Vishnuprayag, Pandukeshwar, Hanuman Chatti and Lakpal are shown therein. The trek from Govindghat to the Valley of Flowers is delineated fully.
CHAMOLI
and
PITHORAGARH DISTRICTS

The region was surveyed in 1962. The map was issued in 1968.
The scale is 1 : 50,000.

\[
\begin{array}{|c|c|c|}
\hline
\text{Grid number} & 55 \text{ to } 85 & 65 \text{ to } 92 \\
\hline
\text{Latitude} & 30^\circ, 30' \text{ to } 30^\circ, 45' & \\
\text{Longitude} & 79^\circ, 45' \text{ to } 80^\circ, 00' & \\
\hline
\end{array}
\]

The summits of Dunagiri, Purvi Dunagiri, Kalanka Choti, Kunti Bhanar and Lampak groups are the
main features of this map. Godia Bank, Raj Bank, Kalla Bank, Ghalon Bank, Lampak Gal, Siranuch Gal, Bangni
Bank, Dunagiri Bank and Gankhwai Bank are the glaciers shown therein. The townships are: Bamba, Malari
and Tolma. The courses of rivers Dhauliganga and Girithiganga are traced here.

CHAMOLI DISTRICTS

The region was surveyed in 1962. The map was issued in 1964.
The scale is 1 : 50,000.

\[
\begin{array}{|c|c|c|}
\hline
\text{Grid number} & 25 \text{ to } 55 & 44 \text{ to } 71 \\
\hline
\text{Latitude} & 30^\circ, 15' \text{ to } 30^\circ, 30' & \\
\text{Longitude} & 79^\circ, 30' \text{ to } 79^\circ, 45' & \\
\hline
\end{array}
\]

Tapoban, Rini and Lata are shown here. In the region south of these townships flow the two main
rivers Nandakini and Birahiganga. The noteworthy peak is Nandaghungti. The main feature of the map is
the Dasoli Reserve Forest. The pass Kunwari Khal links the Dhaulig region with the Nandakini region.

ALMORA, CHAMOLI
and
PITHORAGARH DISTRICTS

The region was surveyed in 1963-64. The map was issued in 1966.
The scale is 1 : 50,000.

\[
\begin{array}{|c|c|c|}
\hline
\text{Grid number} & 27 \text{ to } 58 & 68 \text{ to } 95 \\
\hline
\text{Latitude} & 30^\circ, 15' \text{ to } 30^\circ, 30' & \\
\text{Longitude} & 79^\circ, 45' \text{ to } 80^\circ, 00' & \\
\hline
\end{array}
\]

The main part of the Nanda Devi block is shown here. Trisul, Mrigthuni, Mangtoli, Panwali Doar, Nanda
Khat, Nanda Devi East, Nanda Devi, Bethartoli Himal and Devasthan I and II are its principal peaks. The
glaciers within the sanctuary are: Hanuman Bank, Ramni Bank, Changabang Bank, Uttar Nanda Devi Bank,
Uttari Rishi Bank, Dakshni Nanda Devi Bank, Dakshni Rishi Bank, Trisul Bank, Bethartoli Bank, Raunthi Bank
and Nanda Ghungti Bank. The glaciers outside the sanctuary are: Sili Samudra Glacier, Bidaligvar Glacier,
Mrigthuni Gal, Mangtoli Gal and Buria Gal. The well-known passes are: Sundardhunga Khal, Pindari Kanda
and Nanda Devi Khal. The course of the river Rishi is in the middle of the sanctuary and towns of Dubrubota
and Lata Kharsak are on it. South of the block is the vast Dasoli Reserve Forest.

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ALMORA, CHAMOLI
and
PITHORAGARH DISTRICTS

The region was surveyed in 1963-64. The map was issued in 1965. The scale is 1 : 50,000.

Grid number
Latitude 30°, 15' to 30°, 30' 30 to 60
Longitude 80°, 00' to 80°, 15' 92 to 119

This map is the extension of the northern part of the main Nanda Devi block. Mangron, Deo Damia, Bamchhu, Syakaram, Latu Dhura, Nanda Devi East, Chhanguj, Nanda Kot and Nandakhani are its main peaks. The associated glaciers are: Mangron, Pachchmi Bamchhu, Syakaram, Timphu, Panchhu, Milam, Kwalgang, Burphu, Lwa, Pindari, Chhanguj and Shalang. The river Goriganga with its principal towns Milam and Martoli is on the map.

ALMORA
and
CHAMOLI DISTRICTS

The region was surveyed in 1963-64. The map was issued in 1967. The scale is 1 : 50,000.

Grid number
Latitude 30°, 00' to 30°, 15' 00 to 30
Longitude 79°, 45' to 80°, 00' 71 to 98

The region south of the Nanda Devi block is shown in this map. The glaciers in it are: Mulkotha, Mrighthunl and Mangtoli Gol. The rest of the map is covered with forests — Dhakuri Reserved Forest, Sundardhunga Reserved Forest and Dhanpur Bichla Forest. The main river is Pindar. Loharkhet, Dwali and Phurkiya are some well-known towns.

ALMORA
and
PITHORAGARH DISTRICTS

The region was surveyed in 1963. The map was issued in 1965. The scale is 1 : 50,000.

Grid number
Latitude 30°, 00' to 30°, 15' 02 to 33
Longitude 80°, 00' to 80°, 15' 95 to 122

This map shows the eastward extension of the region south of the Nanda Devi block. In it the courses of the rivers Ramganga and Goriganga are traced. Between the rivers are extensive forests and some towns.
PITHORAGARH DISTRICT

The region was surveyed in 1921-22 and again in 1963. The map was issued in 1966. The scale is 1:50,000.

<table>
<thead>
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<tbody>
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<td>30° 00' to 30° 15'</td>
<td>80° 15' to 80° 30'</td>
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