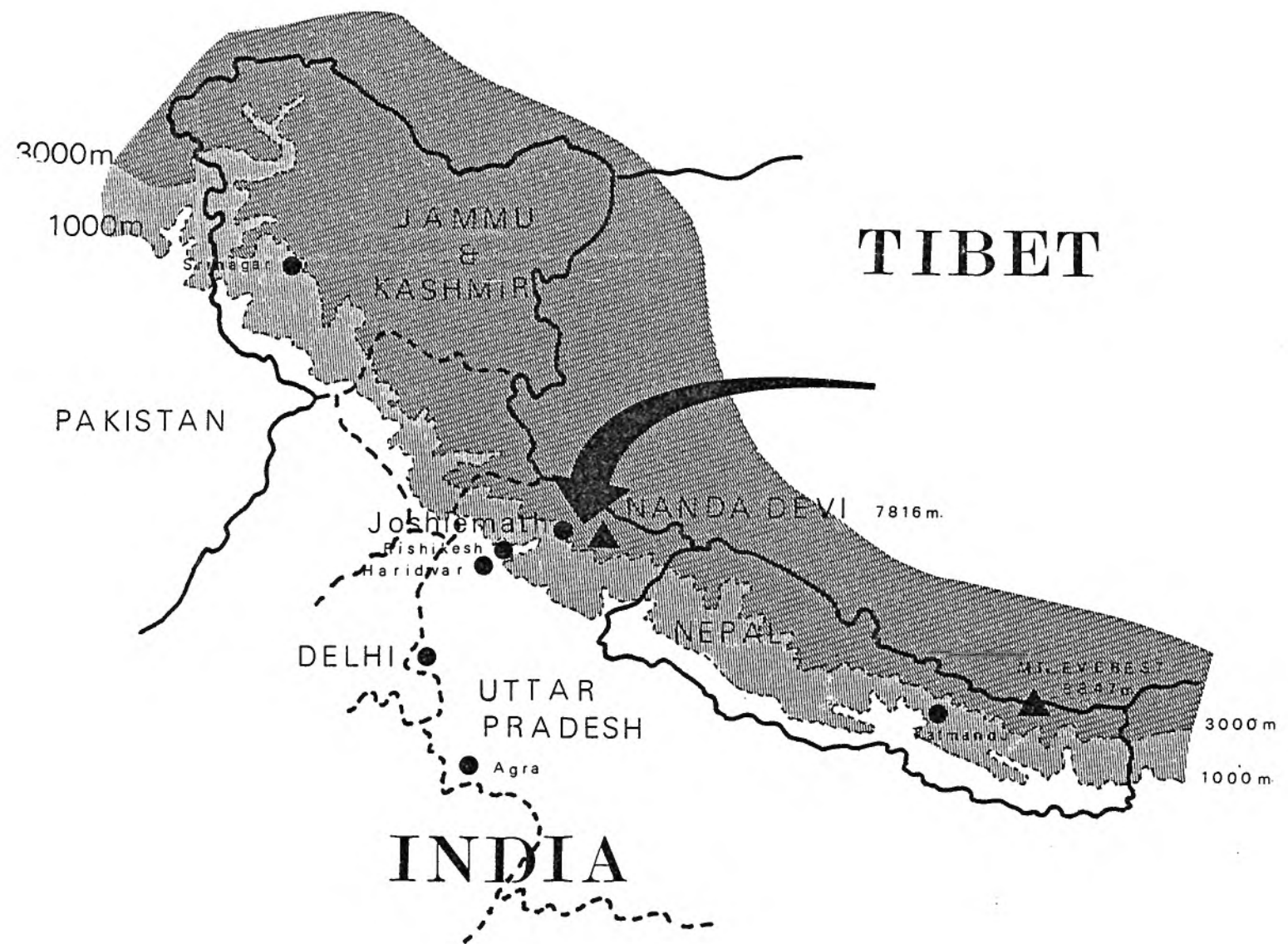




**THE CAMBRIDGE GARHWAL  
HIMALAYA EXPEDITION**



Report of

The Cambridge Garhwal Himalaya

Expedition

1977

Edited by J C Williams

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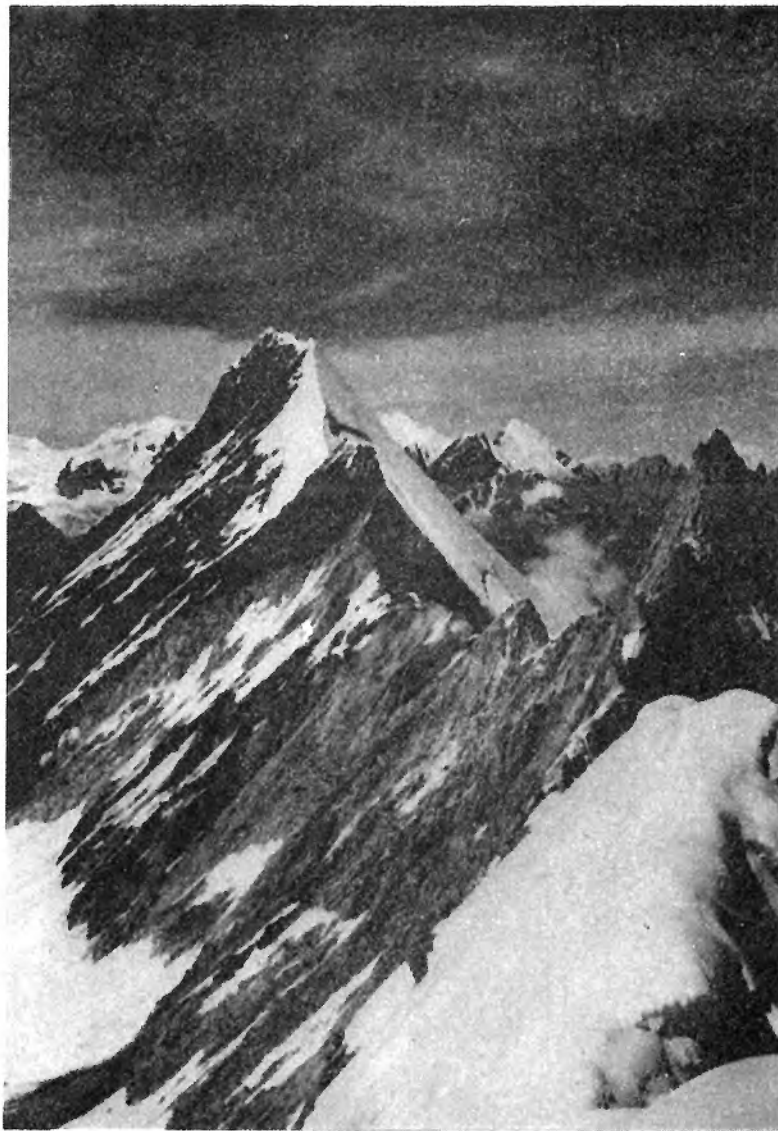
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EXPEDITION MEMBERS

- Martin Gledhill - Leader.  
Undergraduate student in Physics, Selwyn College,  
Cambridge.
- Tim Reed - In charge of Ornithological project.  
Undergraduate student in Geography, St. Johns  
College, Cambridge. Licenced bird ringer.
- Tim Hurrell - Climbing and Ornithological project.  
Graduate Engineer. *Upper cross  
Carbigan Rd  
Marlborough, Wilts*
- Jenny Williams - Ornithological project and Food Officer.  
Graduate Biologist.
- David Harper - Member of climbing party.  
Graduate student in Computer Science, Cambridge.
- Mark Pezarro - Member of climbing party.  
Graduate student in Computer Science, Darwin  
College, Cambridge.
- John Coxon - Climbing and Ornithological project. Doctor.  
Registered Medical Practitioner.

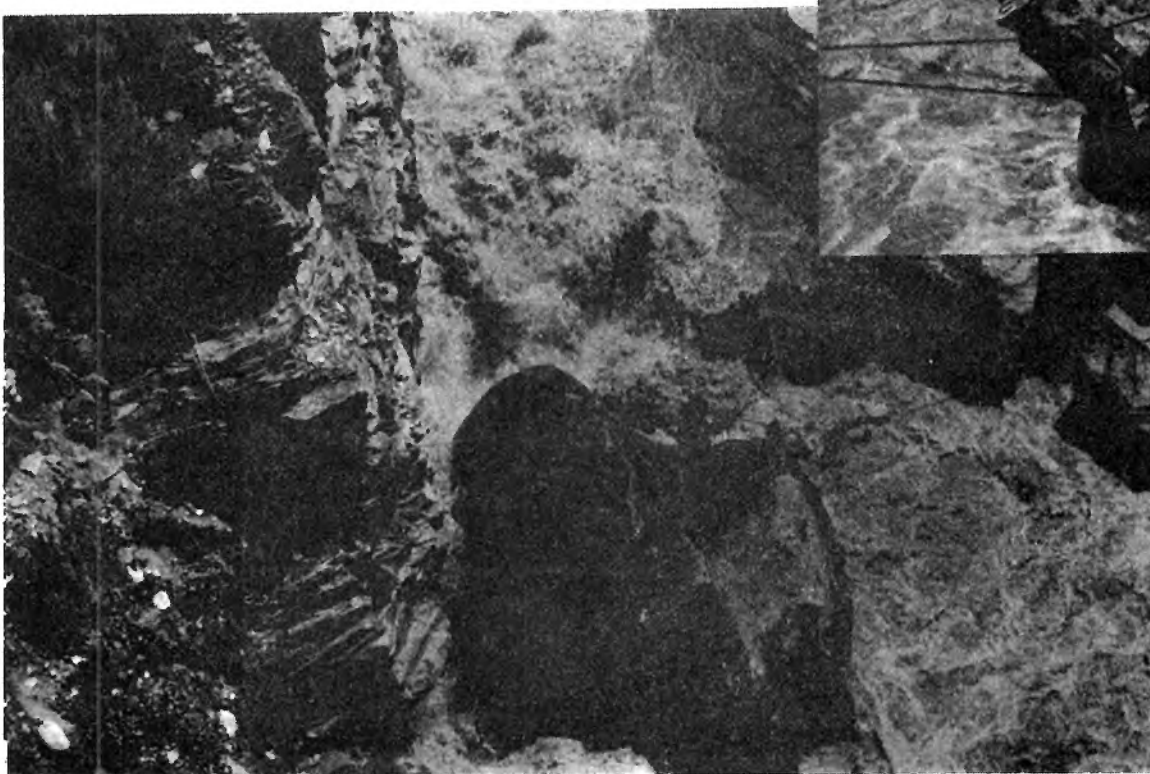
## EXPEDITION TIMETABLE

June 26th	First five expedition members left London
June 27th - July 4th	Preparations in Delhi
July 4th - July 8th	Travel to the Government Sheep Station, Rishikesh
July 8th - July 16th	Work on the ornithological and influenza projects
July 11th	The remaining two expedition members arrive in Delhi
July 16th	The two expedition parties both arrive in Joshimath
July 17th - July 21st	Preparations in Joshimath and Lata
July 21st - July 31st	The walk-in up the Rishi Gorge and establishment of Base Camp
August 6th	Establishment of Camp 1
August 10th	Establishment of Camp 2
August 17th	Successful ascent of the Snow Summit
August 20th/21st	Successful ascents of Rishi Kot
August 25th - August 29th	The walk-out to Joshimath
September 3rd	Return to England



Above: Rishi Kot from the North-East.

Below: Crossing the Rishi Ganga at Gupa.



## CONTENTS

	Page
<b>INTRODUCTION</b>	
The expedition aims	1
Preparations in Cambridge	1
Diplomatic preparations in Cambridge	2
<b>EXPEDITION ACTIVITIES</b>	
Getting hot and sweaty in Delhi	4
Delhi - Joshimath and the birds .....	5
..... In which we meet NK and our luggage gets wet again	7
Joshimath where the expedition gets its g(oats)	8
The walk-in to the Nanda Devi Sanctuary	12
Life at Base Camp	16
The establishment of higher camps	19
Ascent of snow summit	21
Ascent of Rishi Kot	24
The final instalment of an everyday story of crazy people, or 'the return'	25
<b>SCIENTIFIC REPORTS</b>	
The geomorphology of the North Rishi valley	27
Ornithological programme	30
Vegetation studies	34
<b>FACTS AND FIGURES</b>	
Transportation	36
Food organisation or 'how not to make the mistakes we did'	37
Equipment	42
<b>FINANCES</b>	44
<b>ACKNOWLEDGEMENTS</b>	45

INTRODUCTION

Martin Gledhill

Jenny Williams

The expedition aims

The Cambridge Garhwal Himalaya Expedition arose more from a desire to travel than from a particular wish to visit the Garhwal, and from the various leanings of the interested parties it was inevitable that wherever we ended up we would indulge in a mixture of climbing and bird watching. Conversations with people who had been there in 1976, and a bit of background reading, suggested that the Nanda Devi Sanctuary would suit our purpose admirably: stories were told of unclimbed peaks, "the most beautiful area that side of the Western Alps", and there were no ornithological records of the area at all. In addition, it was rumoured that there were plans to drive a four-foot wide track up the Rishi Gorge to encourage the tourist trekking traffic, so it would be a good idea to go before the area was totally spoiled.

The aims of the expedition were threefold: to climb Rishi Kot, a 6240 metre peak which lies on the ridge running South-West from Changabang in the Nanda Devi Sanctuary; to study the birdlife of the area, its ecology, altitudinal zonation and in particular to establish proof of breeding; and to collect avian cloacal swabs and blood samples (to send back to London in liquid nitrogen) as part of a study of the influenza virus by the World Health Organisation.

The purpose of the influenza project was to gather evidence to test theories on how new human influenza virus strains arise. It is thought that this may occur when an existing human strain hybridises with an animal one. It is already known that animal populations contain a natural reservoir of influenza virus and birds provide a convenient source of samples to test since they are fairly easily caught. In addition, very little is known about 'flu in India - an area where the incidence of man/animal contact is also very high.

In conjunction with the influenza project the expedition was to weigh, measure and ring the birds caught, before releasing them unharmed. The data was then to be sent to the Bombay Natural History Society as part of the Indian bird ringing scheme.

Preparations in Cambridge

By the beginning of November, we knew where we were going and what we would do there, and had eight interested people: all that remained was to obtain permission, raise a few thousand pounds, and arrange such mundane matters as food,



transport, equipment, insurance, liquid nitrogen and the many little et ceteras. One of the more difficult problems which we were continually up against was choosing a mutually convenient time when we could meet once a week to report progress, discuss possible sources of income and what we should need to take with us, and inform the caterer of our nutritional fetishes. We usually ended up having a subsidiary meeting on Sunday mornings when we trampled the daffodils in St. John's Fellows' garden as Tim R. attempted to initiate us into the niceties of bird netting and the delights of getting white polka-dot stains down our clothes.

The middle of Lent term brought us the first results of the several hundred letters we had written over Christmas, asking for support, but it was not until after Easter that we could finally say we had enough money to get us to India and, more important, back. In addition, we had received enough donations of food to keep us off curry for a few weeks, and had offers of good discounts from several equipment manufacturers and retailers. At about the same time, we also received permission from the Indian Mountaineering Foundation to climb Rishi Kot, a 6240 metre peak South West of Changabang. Our number fluctuated between seven and eight as, one by one, four of the original members were forced to withdraw by academic and job commitments; being replaced in turn by Mark, Jenny and Tim H. (who, at two weeks' notice, did not need any persuasion to leave his job).

In order to finish the influenza work before moving into the mountains, we decided to leave in two groups, the first five flying out on 26th June, to be joined by Mark and Dave two weeks later. The amount remaining to be done seemed to increase in inverse proportion to the time left before our departure. We filled up one room in Dave's house with food and equipment and gradually spread out to occupy the rest; sorting, checking and weighing everything before finally packing it into boxes ready for air freighting. Inbetween times, May Balls, farewell parties for those whose three years' idleness was over, graduation and academic work were fitted in where convenient. Thus it was a pleasant relief to roll up at Heathrow on an overcast Sunday afternoon with the only thing remaining to be done being to persuade the airline to let us take 35 kilos of luggage each. After the previous eight months, that was a pushover.

#### Diplomatic preparations in Cambridge

Because of its position near the Tibetan border, the Garhwal is a politically sensitive area, and, following a ban lasting some twenty years, foreigners were only allowed into the Nanda Devi Sanctuary from a few years ago. Since then restrictions have eased a little, and should continue to do so, and the area has become more frequented by climbers.

Applications to climb are dealt with by the Indian Mountaineering Federation (IMF) who ask for at least six months' notice. As well as giving official sanction for expeditions, the IMF help with customs clearance and obtain exemption from duty. It is possible that they may also provide information on matters like food and transport in India; we would have been particularly grateful for the latter. A booking fee of Rs. 2,000 (about £130) is charged for the peak you apply to climb and you are supplied with a liaison officer, who should be equipped to the same standard as the rest of the expedition, fed and paid. (Fortunately we had a student liaison officer who, in the last respect at least, cost us nothing.)

We sent off a preliminary enquiry at the beginning of November and received application and goods import licence forms two months later. Initially we asked to book a peak in the North-East rim of the sanctuary, but this area turned out to be still closed to foreigners and eventually we had to settle for Rishi Kot, our fourth choice but reputedly unclimbed. The application form requires tenfold copies of lists of members, equipment, food etc. - the first of which we had to update at fairly regular intervals - and we returned our import licence application form with 95% of the answers as "not applicable". (We thought that questions relating to the production of our factories in India over the last two years would be difficult to answer otherwise). Special visas are not required for British passport holders. We also informed the Foreign and Commonwealth Office of our plans, and through them the British High Commission in Delhi.

To find out about any regulations concerning bird netting, Tim R. contacted the Bombay Natural History Society which co-ordinates the Indian ringing scheme. At the end of a lengthy correspondence it appeared that licences for netting and ringing are issued after a personal visit to the Ministry of Agriculture in Delhi. These were duly gained after arrival in Delhi. Because of a shortage of Indian rings, permission was given to use a special stock of British rings for our ringing and netting projects.

Finally through Sudhir Wanmali, an Indian studying for a Ph.D. at St. Johns, we obtained useful letters of introduction to Professor R. Ramachandran of Delhi University (who allowed us to use the University Guest House while we were staying in Delhi), Mr. P. C. Mehra (Manager of Western Electronics) and Mr. R. N. Haldipur (Director of the Institute of Public Administration).

EXPEDITION ACTIVITIESGetting hot and sweaty in Delhi

Martin Gledhill

We planned to stay in Delhi for up to a week - besides having an amount of "diplomatic" work to do (obtaining letters of introduction, permits etc.) we also had to buy food and equipment and investigate the local transport. Our immediate efforts at meeting our various contacts in Delhi came to nothing when the first two were found to be ill: fears that maybe the expedition was jinxed were confirmed when the third was reported as being unable to come to work due to a stomach upset.

The diplomatic initiative was pursued on two fronts; at the IMF, secluded in a dark corner of the sprawling Defence Ministry enclave, and in a refreshingly air-conditioned office in the Ministry of Agriculture building. We were agreeably surprised to find that the IMF had already arranged customs clearance for our unaccompanied baggage, and they gave us a letter, saying that the IMF would ensure re-export of our equipment, to take to the customs. They also said that they hoped to find us a student liaison officer (rather than an army man) who might fit in with us better - this too was welcomed. A final example of their efficiency was the prompt demand for the Rp. 2,000 peak fee.

Freeing our baggage from the customs was not as easy as it first appeared. Because the only names on the Airway's bill were Mark's and Dave's we were continually having to explain that we were all on the same expedition and collecting it for them. A second hindrance to progress was that the customs had not yet received an "Ad Hoc Exemption Order" from the IMF, and nothing could be done without it. We were fortunate that one of the officials took pity on us, suggesting that the best procedure would be to arrive early and have someone follow later with the necessary documents from the IMF. This practice is certainly recommended. It is useful to have several copies of a complete list of the goods you are importing, and to try and enlist the help and sympathy of an official to guide you through the signature-gathering maze which seems to accompany all such transactions. Out of some eight hours spent at the customs, only ten minutes were spent in actually inspecting our baggage.

While, variously, Martin, John and Tim H. were shuffling papers at the airport, Tim R. was visiting the Ministry of Agriculture to obtain official permission and letters of authority for the bird ringing, netting and sampling. Mr. Jayal, the official concerned, proved to be very helpful and had himself been to the sanctuary several years ago. As a special request, he asked us to make a study of the effects climbers were having on the area, which he would like to see of very

restricted access. This study was all the more pertinent because there are plans afoot to drive a four-foot wide track up the Rishi Gorge. Once we had obtained our bird samples, Mr. Jayal also helped us with clearing them through customs to export them to England. (We had been told that our nitrogen cylinder would have to be inspected inside before it could leave India - never mind if this meant pouring liquid nitrogen all over the place.)

Through Mr. Haldipur we obtained an introduction to the manager of the "Super Bazaar", a sort of supermarket and department store, where we were able to buy most of the food we needed. Tinned food was purchased at another shop, the Empire Stores. It is possible to buy most basic foods in Delhi at a reasonable price, and a small range of tinned stuff (fish, sausages, bacon etc.). However dried food and chocolate should be imported. Near to the Super Bazaar were a number of hardware shops where we bought a few odds and ends, notably a chapatti plate (since the staff at the guest house had instructed us in the art of chapatti making) and a fish slice with a 25 year guarantee.

Our final task was to arrange our road and rail transport to Nainital and Joshimath. We had now worked for six days and the seventh was a Sunday so we had a day of rest. A spot of light packing in the morning was followed by an overcast afternoon's sightseeing in Old Delhi and the evening saw us off on the overnight bus to Nainital.

#### Delhi - Joshimath and the birds .....

Jenny Williams

We left Delhi on the evening of 4th July and travelled overnight by bus (from the Inter-State Bus Station at Kashmiri Gate) to Nainital. We chose on this one and only occasion to go by de-luxe service and on this one and only occasion the bus was very comfortable. We had been told that the area was abundant in birds, but all we were greeted with when we arrived in the early morning was our first real taste of the monsoon. Nainital is supposed to be a beauty spot, but we saw little of it through the clouds and the rain.

We stood and dripped all day beside our dripping luggage and at 5 p.m. were able to get a bus to our destination at the Indian Veterinary Research Institute at Mukteswar, only 5 km from Nainital by crow, but several hours by bus over tortuous mountain roads. The views of the foothills were fabulous when the rain stopped and the clouds lifted. Dr. Mallick, the Institute's Director, had previously sent avian samples to London for investigation. However it was obvious from the steep terrain and bad weather that our catch of birds would be very poor, so after a fruitless afternoon's netting, and despite the hospitality shown us by

Dr. Mallick, we decided to move on as soon as possible to Rishikesh - a town in the lowlands, at the foot of the Himalayas. It took us a day and a night of wearying bus journey to get to the Government Sheep Station, where we were able to stay and work at the kind invitation of Dr. Saxena. This area seemed more promising with a variety of habitats abundant in birds, so we settled in at the guest house and started work.

We quite quickly settled into a routine of getting up with the dawn chorus, netting a fair proportion of it, then swabbing, measuring and ringing. A representative of each species was photographed, both for reference and to help in later identification where this was uncertain in the field. Unfortunately most of the birds were too small to allow blood samples to be taken, but many involuntarily co-operated when we wished to take cloacal swabs by providing suitable material on hands and clothing. In addition to 41 species of birds, we also managed to net two water buffalo and a dog, and narrowly missed one of the local populace on his bicycle.

After a couple of days Martin returned to Delhi to meet Mark and Dave arriving from England, buy the rest of the food and travel to meet us at Joshimath, from where we would organise the mountaineering part of the expedition. The remaining 'scientific' party spent long days working the nets, in lime orchards with a dense undergrowth of cannabis, getting our bodies very sunburnt and our feet like raw, withered prunes in the constant wet underfoot. It was searingly hot in the mornings and rained heavily in the afternoons.



Above: An Indian bus on the high mountain roads.

A one-day bus strike gave us a thankful day's rest before we set off again for Joshimath, leaving John to return to Delhi to ship the bird samples back to England. We had an eventful day's bus journey involving a crash, a puncture, a riot and a breakdown, before arriving in Joshimath in the evening to have (almost) the whole expedition together in the same place for the first time.

..... In which we meet NK and our luggage gets wet again

Martin Gledhill

Having located the correct bus station in Rishikesh, from the selection of three or four available, the ride back to Delhi was uneventful, uncrowded, unaccompanied by heaving heavy boxes onto the roof, and, in short, quite unlike any bus ride I had yet made in India. Hoping to meet Mark and Dave I rushed out to the airport, sharing a taxi with an American who was obviously impressed by my intimate knowledge of the whereabouts of the various air-cargo terminals, customs go-downs and plant quarantine establishments. I might just as well have gone straight to the Guest House, where Mark and Dave were sleeping away peacefully, after their flight had arrived on time.

They were soon introduced to the high spots of Delhi - the Empire Stores, whose stocks of canned goods we almost depleted; the tourist office (to get free maps of the city); and the fight for survival on the buses. In a brief sortie to the IMF we learned that our student liaison officer (l.o.) had turned up and would telephone us at the Guest House. On the strength of this we reserved four rail tickets to Haridwar for the following night (13th). As we did not know the l.o.'s name we reserved his ticket for Mr. A. N. Other, alas he did not get the joke. His real name, as we found out when we met him the next day, was Neelam Kumar, which we shortened to NK, and he was a scientist with an astonishing command of mid-sixties mid-Atlantic slang. Through the IMF he had been on a couple of climbing courses but seemed to have little other experience, however as we were only counting on him to translate for us this was not too important. After we had arranged insurance for him (the IMF insist on this being done in Delhi) he left us to tell his mother he was going out, and we packed everything up.

The first part of our journey to Joshimath, by train to Haridwar, passed off as planned, although manhandling our  $\frac{3}{4}$  ton of baggage around the station was a sweaty effort. Impecunious as we were, it would probably have been a few rupees well spent to get the luggage-humping done for us, rather than wear ourselves out too soon. We had been told in Delhi that we could get buses from Haridwar to Joshimath every half hour, the journey taking five hours. To imbue this information with even more authenticity, as we were pulling into Haridwar just after dawn,

a fellow passenger told us there was a bus at ten past eight. Thus our surprise can be imagined when we rolled into the bus station to find, (i) there were no buses that day, and (ii) an impending bus strike meant there would be none the day after either. To damp things down even more the monsoon chose that particular moment to ensure that this new set of luggage received similar treatment to that taken to Nainital. Indeed, by comparison, the Nainital deluge was like a light drizzle. After all the cardboard boxes had been made thoroughly soggy, in spite of the poly bags draped over them, we were allowed to stack them in a covered passage behind the enquiry office. This building was well named because we kept receiving enquiries as to whether we could spare a poly bag or two.

The strike still impending, NK and I headed off to Rishikesh, only 30 km. distant, to see how the bird work was progressing and to find out about buses from there. A comprehensive tour of the bus stations with Tim H. discovered a remarkable degree of solidarity and an aversion to blacklegging, so we parted from Tim saying we hoped to see him some time in the not-too-distant future at Joshimath, and returned to Haridwar. Here Dave and Mark had been having a hard time keeping the locals and wind-driven rain off our boxes. However they had managed to get the use of the enquiry office itself, for us and our boxes to sleep in overnight, so when the busmen went home after a Union meeting, we moved in for what would seem to be a long occupation.

Joshimath where the expedition gets its g(oats)

Martin Gledhill

Tim Hurrell

It was nine o'clock at the station and nothing was stirring, not even a little bus. Then right out of the blue came the surprise announcement that we'd be leaving in half-an-hour. In case they changed their minds we hurriedly bundled our luggage onto the roof of the bus, nearly pulling Mark up too when his finger caught in a nail on the porridge crate. The first part of the journey was on the now familiar road to Rishikesh, then the road gained height gently as we entered the foothills, always following the Ganges. By rights, most of our luggage should have travelled free, since passengers are allowed to take their food on the bus and not be charged for it. However the bus conductor would not be convinced that we really had 500 kg. of food, and billed us accordingly. It came as no surprise to find that the Delhi Tourist Office's estimate of the journey time - 5 hours - was hopelessly wrong; by nightfall we were still 2 hours from Joshimath and the buses don't (or daren't) travel in the dark on the mountain roads. We were happy to take up the offer of a cheap room for the night, managed to persuade a cafe to make some non-spicey food (no mean achievement), and had our first reasonable

night's sleep for some time.

The next day - the 16th - after an impressive ride up the Alaknanda Gorge, we arrived in Joshimath and put up at the Neelkanth Hotel. We crammed the seven of us into two small rooms for the sake of economy, but any minor discomforts were more than compensated for by the splendid view across the valley to the crags and green, velvet-like slopes. We soon met our contact in Joshimath, Yashwan Singh Pal (Yashi) who worked at, and effectively ran, the Nanda Devi Hotel. No doubt had we met him sooner he would have offered us even more reasonable terms than the manager of the Neelkanth. So as to even things out between the two establishments we took most of our meals at the Nanda Devi. Tim, Tim and Jenny arrived the same evening, John having gone back to Delhi to air-freight the bird samples back to England. Tim H. was in bad shape with shingles but this did not stop him going out birdwatching with Tim R. and Jenny, and the only mishap occurred when he lost his over-shirt and in turn was lost himself when he went back to look for it.

Joshimath is a small provincial town set 4000 ft. above the Alaknanda River on the side of a mountain. The town has a couple of main streets, lined with shops built of concrete and corrugated iron. Further from the centre it becomes more primitive, with small hamlets built from stones, mud and thatch, set among terraced fields. It was from Joshimath and Lata, a village further up the valley, that our porters came.

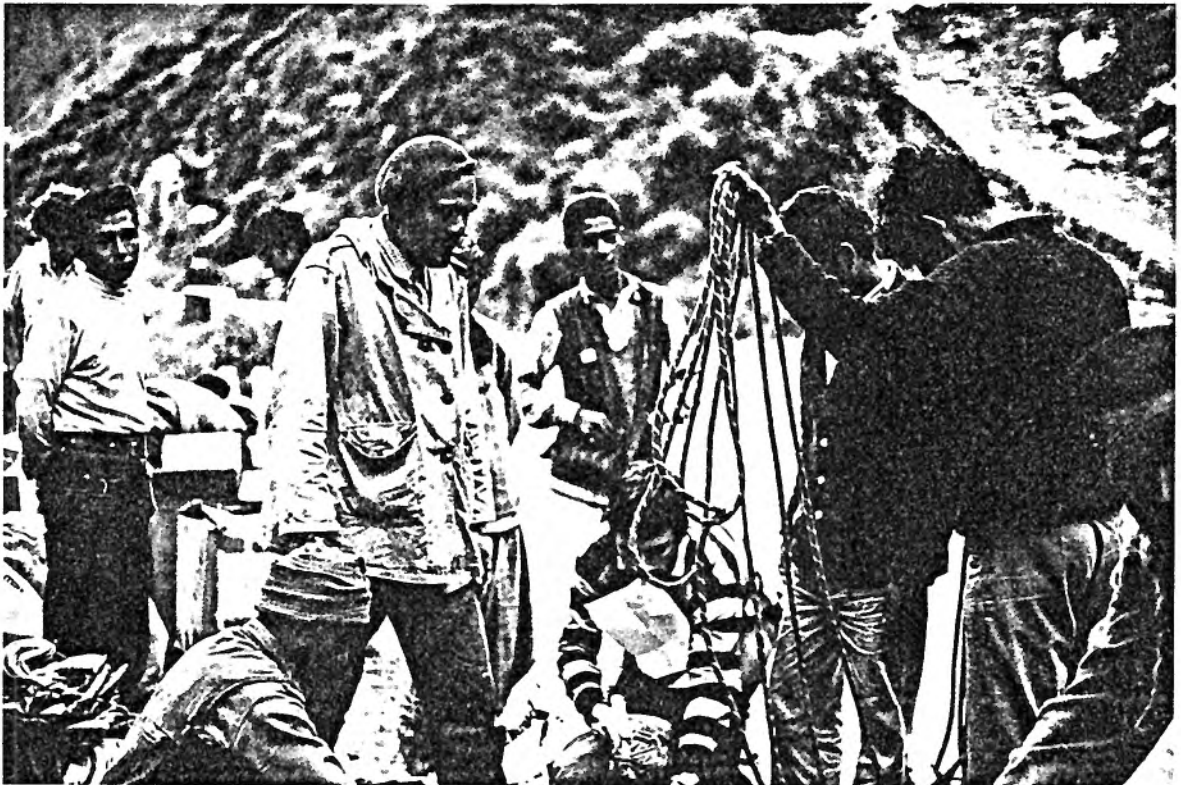
We arranged through Yashi to hire our porters and goats to carry food and equipment up the Rishi Ganga Gorge. Goats cost as much, per weight of load carried, as porters, but they do have the advantage that they are a lot less uppity, do not need food providing for them, and are more honest. The big drawback, as we were only informed after the first day's walk, is that they can only make it two-thirds of the way up the gorge. Had we known this earlier we would not have relied upon them so heavily (to start with we had fifteen porters and twenty porter-equivalents carried on goats) and avoided many problems later. Each 25 kg. load, carried by porters or goats, costs 15 rupees for each stage (there are nine stages to Gupa where the Rishi River divides) and for each stage they return the porters get half pay.

We had to supply food for the porters and again Yashi helped us buy this. Having been told by NK that we were hard up, the quantities he suggested were minimal (again without our knowledge). To add to our problems we had to take on three extra porters at short notice as not enough goats arrived. These extra porters had to be fed of course - out of the food that we had already purchased for a smaller number of porters. Yashi had told us that if we ran out of food there were three dumps left by a recent expedition. Two of these had already been



raided by the time we got there (quite possibly by our own porters) and the third, up at the Changabang Base Camp, did not contain large quantities of rice and flour - the staple porter foods. We had to resort to giving the porters our own supplies of rice and flour and sending two porters back to Joshimath for more.

We spent most of the 19th packing, which apart from putting all the food into polythene bags was a wasted effort; the day after, we took the bus a few miles up the road to Lata, and there beside the road, at the start of the walk-in route, packed everything again into goat bags and porter loads. Each porter load is carried in a gunni sack (which we had to provide and bought in Joshimath). The porters are excellent at packing their own loads and know what 25 kg. feels like, so it is important to have an accurate spring balance to prevent arguments. They like to have a little spare room in the top for stowing their personal belongings (bedding or cooking utensils etc., which are carried in addition to the 25 kg.) before sewing the sacks up. Goats can only be used for carrying non-breakable, non-damageable, small items that can be crammed into a small double bag, which the goat carries astride his back, with 5 kgs. hanging on each side. Once full the bags are sewn up at the top, which is just as well because the bags received a terrible knocking (especially when they fell off and rolled down the cliff). The labels came off the tinned food and any single item was hard to find



Above: Spaghetti rope! After a while we gave up trying to keep things organised and left the porters to it.

amidst the heap of bags. We did identify the bags initially, but the goatmen subsequently rearranged the contents to their own satisfaction. Nor did the goatmen treat the loads with great care, e.g. we watched in horror as they stuffed the climbing ropes (which had previously been in neat coils) into bags as if they were a tangled mass of wet spaghetti. As there was a high risk of losing a load it was necessary to spread important items around. One complete bag was lost and the goat responsible had its throat cut and was eaten. (We lent a sharp knife for the bloody deed, and in exchange received some meat that was chewy but tasty.)

We spent a whole day sitting amidst a pile of food and equipment which appeared to be ever-increasing in entropy. When we knocked off for the night we still had quite a few things to be packed, so the next day we took on three extra porters. The 21st dawned depressingly sunny, the goats arrived and were loaded up and soon set off with Tim, Tim and Jenny. Fortunately John arrived with Dave (who had waited in Joshimath) on the morning bus, and the rearguard too was able to set off up the steep track.



Above: Sewing up the goat bags at the start of the walk-in.

The walk-in to the Nanda Devi Sanctuary

Tim Hurrell

Jenny Williams



Above: Porter team photograph.

The route started where the regular Joshimath to Lata bus dropped us and about a ton of gear at the roadside, and here last-minute packing and rearranging was done before starting out. The walk-in consisted of nine stages as far as the crossing of the Rishi river at the foot of Nanda Devi, and from there we had to walk up the North Rishi valley and cross the North Rishi river before reaching base camp. Each stage ends at a suitable camping site and each officially takes a day, although we double-staged twice on the way in and both double and quadruple-staged on the way out. However we discovered very quickly that it is not possible to persuade the porters to double-stage if they don't want to.

The walk-in to the Nanda Devi Sanctuary is certainly one of the more difficult and strenuous of the Himalayan walk-ins, and was made even more so by the rain. Walking in the monsoon is a wet, tiring and often depressing experience. It is very important that everything that has to be kept dry is at least double-wrapped in plastic. Wet sleeping bags mean cold nights, unless you are prepared to share, and wet cameras are only of use if you want the photographs to have a misty effect! A few large spare fertiliser bags to give to the porters for their own belongings are much appreciated and as all bags become torn and ripped, spares

0 10 Kilometres



To JOSHIEMATH ←

### LEGEND

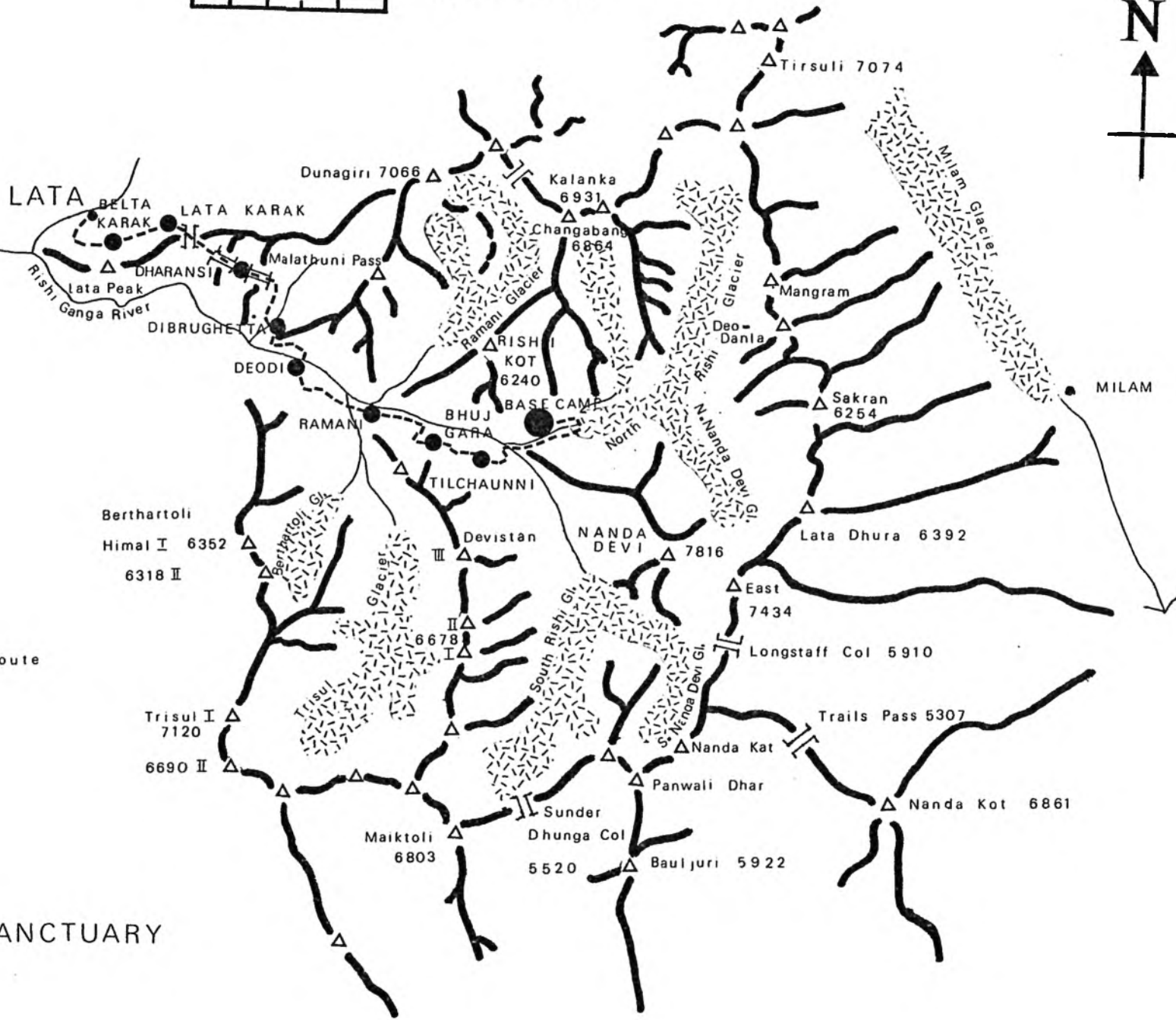
△ peak. height in metres.

] [ pass

glacier

● camp      - - - walk-in route

mountain range



## THE NANDA DEVI SANCTUARY

## & RISHI GORGE

are essential. It is easy to get things wet, and not so easy to dry them out. Wet items become heavier, so the porter with the tents may feel that he is being over-worked. We rested one complete day as it was too wet to go on. The porters still expected to be fed, so some spare porter food is essential. Contented porters make for an easier walk-in.



Above: Loading the goats at the start of the walk-in.

The chief porter or sirdar would act as spokesman for the porters and look after the expedition members as well, by making the fire and collecting the water at each night's stop, and perhaps helping cook, making chai (tea), and, if we were lucky, providing early morning tea in bed. He took great pride in keeping us happy and he seemed to like trying out our more sophisticated and better-made cooking equipment, e.g. the pressure cookers and the Swedish primus that was so much more effective than its Indian counterpart. Perhaps he secretly had his eye on a thing or two, which he hoped to be given as baksheesh. The sirdar carried our cooking equipment and some food, which made it easier for him to have chai in the pot if he beat us into camp!

The day would start with the sirdar resurrecting the fire, and then waking us up. We would have a breakfast of porridge and tea, while the porters would eat chapattis (cooked the previous evening) and tea. Then we would pack up the tents,



the porters would prepare their loads and the sirdar would pack up the breakfast things, having washed them first if we were lucky. The porters slept in caves, so had no tents to worry about. They knew where the best camp sites were, close to wood, water and caves, though the caves were not always big enough, so our tarpaulin was appreciated. The porters would lead off when all was ready and the goats would follow, with the herders trying desperately to keep them together and going in the right direction.

The track led from the roadside up past Lata village, through pine forests and into an Alpine meadow swamped with bright flowers and offering a splendid panorama of clouds, hills and distant snow-capped peaks (Lata Karak). From here the path led a little higher over three passes (14,500 ft.), though in the mist I only recognised one, and down 3000 ft. of steep, desperately slippery mud slope, across a river, through another, and finally to a wet camp site in a thick lichen-covered pine forest at the bottom of the gorge (Dibrughetta, at 10,000 ft.). It was at



Above: Views up the Rishi Gorge in the cloudy conditions accompanying the walk-in.

this point that Tim R.'s 6 ft. high, bamboo bird-netting poles, which we were gallantly attempting to carry into the Sanctuary, got broken in half by their frustrated carriers and were thereafter used as fairly useful walking sticks.

No-one has found a direct way into the Sanctuary by following the river up - which explains the number of steep climbs and descents we had to make. The next few stages, therefore, involved steep climbs out of the gorge, a long, exposed and tricky traverse - especially tricky if you were carrying 25 kg. - and then straight down to the river for a night's rest. River crossing can be difficult, involving jumping from stone to stone or balancing along a slippery fallen pine. One bridge was a number of carefully laid birch trunks - but that was washed away two weeks after we crossed. Another bridge was a proper bridge with wooden railings and held together with nails, but it was lichen and moss covered and rotten with damp.

After six stages at Ramani the goats turned back as the going from then on became harder and even more exposed. The goats were a bit of a novelty and looked good in photographs, but were really more trouble than they were worth. All the goat bags had to be unloaded at Ramani and we hurriedly piled their contents into the Vango Mk. 5. From here on the party split and while most of the expedition continued on up the last three stages to base camp with the porters, Tim R. and Jenny stayed at Ramani to arrange the goat loads into porter loads, and later accompanied the porters on a second trip up to base camp. As it turned out, having relied so heavily on goats for the first part of the walk-in, we had to send most of the porters down to do a third carry up from Ramani, and because of a shortage of food, send two porters right back to Joshimath to buy and bring in more rice and flour.

We had some friction with the porters over food at the start of the trip and at Ramani they went on strike and refused to go any further because of the poor rations we were giving them. Once we had established a fixed ration relations became much more friendly, and indeed the porters could be excellent and friendly companions.

From Ramani onwards the weather improved a little so we could see the river thousands of feet beneath us and appreciate the great task of forcing an initial path between the crags and cliffs of the gorge and up to the Sanctuary. There were a number of fixed rope sections and rope bridges to be made, so it was important to have some rope (preferably cheap rope) and cord handy. The porters liked to show us how they could organise these themselves, which they did fairly competently, though their ideas about the bridges differed from ours. The South Rishi Ganga was crossed first by Mart doing a flying leap, then a rope was fixed up for people to catwalk across. Rucksacks and porter loads were slung underneath on karabiners and hauled across by light cord. Crossing the North Rishi Ganga was

more of an epic as the first person could not cross by jumping but instead had to wade, waist-deep, in ice-cold water charged with lumps of ice and rock and flowing at a furious pace. A rope bridge was soon erected, but because of the sag across 50 ft. of river it was necessary to break up the loads into very small bundles. Ferrying all our gear across the river by this method took several days, and was hindered by an accident on the first day, when a flood of water was released from a pond in the glacier and a huge wave came surging down the river, cutting the rope, moving huge boulders, and sweeping away some of our gear with it. Later we discovered that it was possible to take an hour's walk up the valley and cross the river by means of the glacier snout, although we continued to ferry the porter loads across the river directly opposite base camp.

We kept one porter on as a high-altitude porter to assist in carrying loads up to the high camps, and later sent him back to Joshimath to act as sirdar and bring in a new lot of porters for the walk-out. He was able to buy and arrange the food for the porters for the walk-out which was dumped at various camp sites on their way back in to the Sanctuary.

For the record, we had 15 porters and about 50 goats at the beginning of the walk-in, hired through Yashi. We needed 9 porters for the walk-out, but only 8 actually arrived.



Above: View up the North Rishi valley from above Gupa, Base Camp is arrowed.



Base camp was beside the Rishi river, on a flat grassy site, about half a mile below the snout of the Rishi glacier, and at the bottom of the gully leading up to the higher camps. Firewood and rhubarb were plentiful on the side of the valley, and a meltwater stream joining the river above camp provided superb, clean drinking water.

The river was about 50 ft. wide, an icy raging torrent, carrying with it boulders large and small, and frequently lumps of ice. Initially we used the river for washing up . . . . . Jenny quickly discovered that fast-numbing hands are no match for the powerful river, which claimed a spoon at her first attempt at this chore. A few days later the shock of seeing Tim Reed squatting downstream caused Mart to dispose of a mug in the same fashion; so we decided the extra effort of carrying water for washing up was worth the luxury of retaining our plates. However, the river did provide the useful function of a convenient sewage system - although requiring care to avoid the chilly embarrassment of falling in with one's trousers down!

Life revolved around the camp fire - mainly because it was the only place you could sit in relative comfort and keep dry! After a week or so of rain and cloud the weather settled into a pattern where it rained most afternoons. After a fine, warm start to the morning, clouds quickly gathered over the peaks, and the whole sky was overcast by lunchtime. Keen photographers became early risers, leaping out of bed on clear mornings to photograph the beautiful snow peaks at the end of the valley, before the view was obscured by cloud five minutes later. The wet afternoons began to give way to fine evenings and, towards the end of our stay at base camp, a period of fine weather encouraged us to believe that the monsoon was ending. Alas, our last days there were as wet and miserable as the first.

Our arrival at base camp was heralded by an orgy of washing, with garments swinging from every available piece of guy rope during the brief sunny intervals. It was a risk to wash anything vital, because the weather might change so quickly that it could not be dried out again. In this case the wet clothing would be strung around the camp fire to dry; but, alas, even this was not without risk - a glove, a trouser leg and a plimsoll got burned.

Since the nearest high camp was 8 hours' slog away from base camp the party was only all together at the start and end of the expedition. Communication between the camps was maintained by porter-post - the high altitude porter returning to base camp most evenings - and the porter usually arriving at high camp accompanied by some morale-boosting goody, such as peanut butter chapattis, or rhubarb jelly, from 'downstairs'.

For those of us left at base camp much time was spent maintaining the supply

line going up (i.e. endless evenings and mornings sorting out food) and keeping ourselves fed and the fire going. In between wood, water and rhubarb collecting, fire tending, cooking and washing up, and clothes and equipment mending, we found time to study both the vegetation of the valley floor, and the flora and bird-life of the Sanctuary.

Of course the arrival of the climbers back at base camp for a rest was a marvellous excuse for a day of complete self-indulgence and overeating. Once more the camp sprouted freshly-washed garments; the stream provided a freezing but invigorating bath for the brave; and Martin's oven was put to work to provide non-stop luxury fare.



Above: Members of the expedition around the fire at Base Camp.

Of course the highlight of our stay at base camp should have been the celebration, just before we left the valley, of the successful ascent of Rishi Kot. However, the celebration was dampened somewhat by the fact that Dave was ill, Tim Reed run down by continuing gut trouble, and Mark still shaken from his fall. As a result of an extra-lavish celebration meal, Mark, Martin and John were violently ill the next day, and camp took on a strong resemblance to a hospital. Breaking camp the next day to begin the walk-out was a somewhat subdued affair .....

The establishment of higher camps

Tim Hurrell

The heavy cloud cover accompanying the walk-in, the lack of an adequate map and the differing opinion of the porters and liaison officer, together ensured that our knowledge of the position of and the route to Rishi Kot were only vague. So as soon as possible after our arrival at base camp, two search parties set out to find the mountain.

The weather by now followed a regular pattern of early morning sunshine, followed, usually fairly quickly, by cloud, wind and afternoon rain, so a morning climb to a high point in sunshine was usually rewarded with only a cloudy view. Mart and Tim (H.) were therefore lucky in that they actually saw the mountain. A three hour slog up steep scree and through the rocky crags behind base camp had brought them out on to a ridge, from which they caught a 30 second glimpse before it was veiled in mist. It appeared to be a disappointing heap of rotten rock, sprinkled with snow patches and crowned with a snow ridge. They sat and stared into the mist for three more hours, waiting for it to reappear. It didn't.

As yet we didn't know how to tackle the mountain - whether to climb the left or right flank, so we hedged our bets and established a food and equipment dump at the base. For the next couple of days, while those at base camp still struggled with ferrying the porter-loads across the river, Mark and Tim (H.) carried loads up over the ridge and down to the dump, marking the route as they went with cairns. The route to the ridge was hard going but straightforward, the scree being partially held together with vegetation, but the traverse and descent down to the dump involved a complicated route through loose rocky outcrops and across unstable moraines. Many times the rock slipped away beneath them and they were pitched forward or unceremoniously sat down. It was always a relief to unload the heavy packs, gobble a Mars bar and sit down to recover; but the relief was shortlived as it was always uncomfortably cold and wet. The return journey was quicker - being spurred on by the prospect of a hot meal at base camp.

John was ill, so it was Dave and Mart who made use of the dump to establish Camp 1. The first night they pitched the tent among the rocks and scree beneath the left flank and spent most of the night trying to keep themselves comfortable. In the early morning sun, they spotted a snow summit just peering over the top of the glacier that flowed along the right flank. This snow summit must be Rishi Kot: it looked more like the photographs they had seen and a much more respectable and challenging mountain than the 'heap of rubbish' they were camped beneath.

They therefore moved the camp on to the glacier, finding a route up through the screes and moraines of the right bank, and thankfully skirting a giant ice fall.

This camp (Camp 1) was situated on an ice plateau, criss-crossed by meltwater streams and narrow crevasses. Getting up in the morning here was a pleasure, for as you clambered out of the tent you were greeted by sunshine and a view down the valley to Nanda Devi, that large and impressive mountain that so dominated most of our photographs. That view alone more than justified the rain-filled memories of the walk-in and load carries.

Shifting all the food and equipment over the next couple of days sapped their energy so much that they were pleased to return to base camp and make themselves sick on all that extra food, while Mark and Tim (H.) took over to establish Camp 2. This involved finding a route up through a second, higher, ice fall, and pitching a tent as close to the snow summit as possible.

A route up the second ice fall, keeping to the right bank, looked easy enough, but hidden from below there was one major obstacle - a large crevasse that stretched right across the valley, spanned in one place by a large, sagging ice bridge covered with deep soft snow. Tim tentatively tried crossing, locating the weak points by probing with his ice-axe. There seemed to be too many of these - an opinion confirmed when the bridge started giving way, to throw him forward to complete the crossing in an undignified grovel. Mark went across taking great care to miss the neat round hole that Tim had made. Instead he made his own!

They climbed clear of the ice fall, into a large long snow field with steep Changabang-type granite cliffs all around. (Incidentally, below the top ice fall the cliffs change to a metamorphised crumbly rock and it was this fragile rock the 'heap of rubbish' was made of.) This top field was a silent and eerie place, with a misty cloud cover that alternately let the sun shine weakly, then shut it out altogether.

It was hard and slow work crossing towards the cliffs beneath the snow summit. The altitude (17,500 ft.) and the deep soft snow reduced any route blazing to a very slow crawl. It was all they could do to keep going, stopping repeatedly for breath. They returned without further incident to Camp 1.

The following day they hoped to find a new and less hazardous route up the ice fall, this time attacking the left bank. Despite a much earlier start it was still heavy going as no hard crust had formed on the soft snow. This time only one of them fell into anything but the route seemed to have more obvious dangers as it wound its way past seracs, under ice cliffs, across snow bridges, above ice caves and finally up a demanding ice slope to gain the great flat snow field above. It was certainly a much more exhilarating route, but definitely not suitable for load carrying. Fortunately from a position high up on the left, they spotted a modification to the original route, involving a small traverse across an

ice cliff and another, stronger-looking snow bridge. After dumping their loads at the previous day's turnback point, they established that this new route was suitable.

On the third day they went up again. Treading in earlier footprints proved much easier, so they quickly reached the previous day's dump. In order to pitch the tent, they needed rocks and the only rocks available in this large expanse of snow were beneath part of the cliff that was crumbling away, repeatedly avalanching about every half hour. So Camp 2 was established here - just out of reach of the falling rocks.

Mark and Tim returned to Camp 1, which went against the earlier plans, partly because they were shattered, and partly to find out why the high altitude porter was not appearing at Camp 1 with loads. Unfortunately, John - who had now deemed himself fit, as is a doctor's prerogative - Mart, Dave and a new high altitude porter, Kunwar Singh, arrived that night. Load hauling had been delayed by the departure of the first porter to Joshimath to help police with their enquiries in connection with a stabbing incident. There was not enough tentage at Camp 1, so an uncomfortable but cosy night was had by all.

By now, with the views gained by Mark and Tim, as further evidence, all agreed that Rishi Kot was not the snow summit but, after all, the 'heap of rubbish' behind Camp 1. However with food, tent and climbing equipment now established at Camp 2, it was decided to tackle the snow summit as a warm-up for Rishi Kot proper.

#### Ascent of snow summit

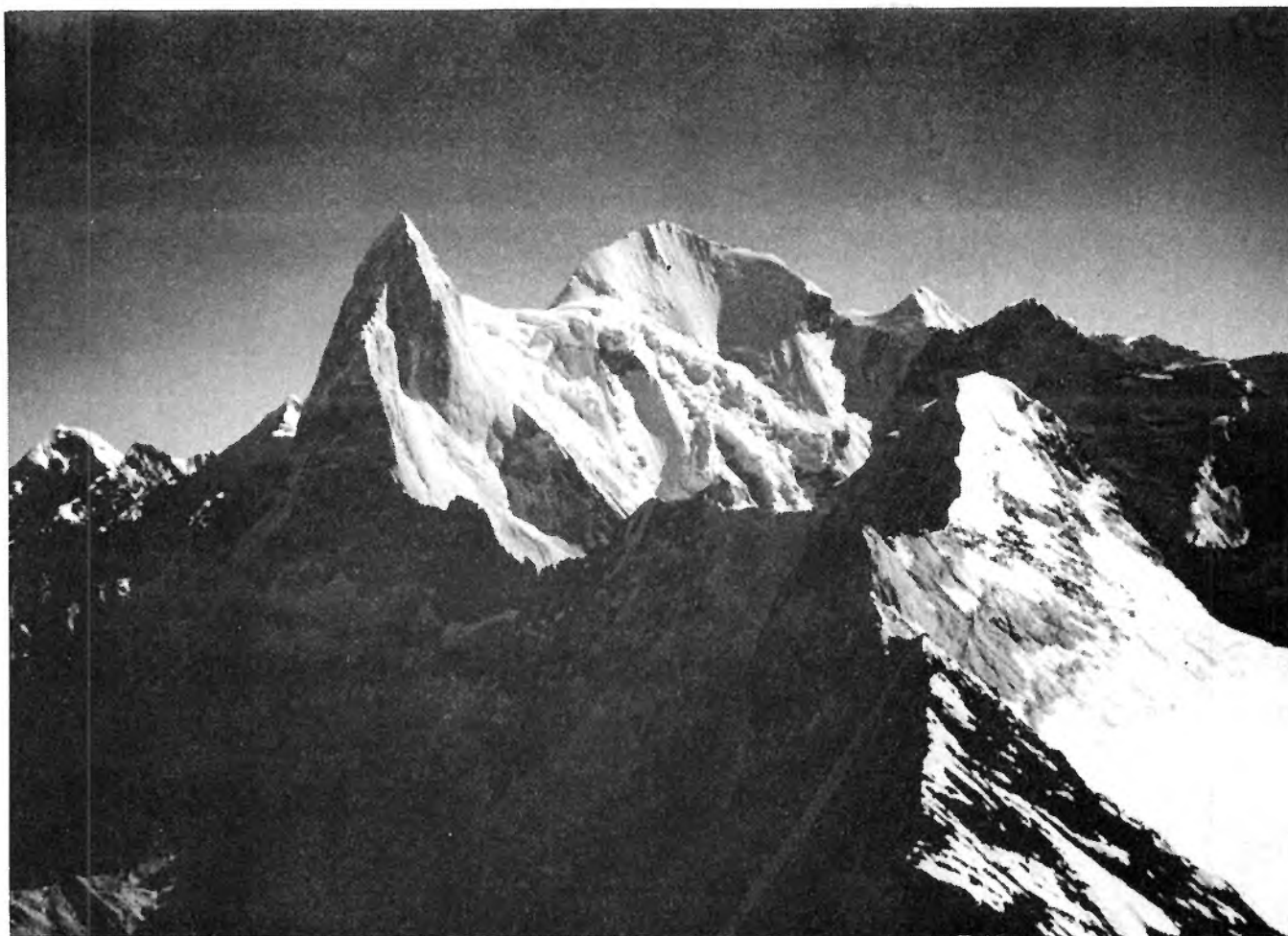
Tim Hurrell

The snow summit was a high point of a snow ridge, situated at the top end of the glacier's snow field; beneath the peak the slopes were studded with granite blocks, leading to a final runout of snow, with a small bergschrund.

The obvious line of attack was to find a way through the granite blocks keeping to the snow, gain the ridge and wander up it to reach the summit. It all looked easy enough.

The weather was slowly improving with sunnier days and colder nights, so the snow at last was becoming harder, easier to walk on, and less prone to avalanches.

The first attempt was made by Mart, Mark and John operating as a rope of three. It was foiled by good weather. They gained the ridge, only to find that it was thigh-deep in sun softened snow. The ridge, instead of having a simple triangular shape was fashioned like a continuous Christmas tree, with a series of cornices on both sides, produced when slab avalanches had cleared the lower slopes,



Above: Changabang and Kalanka, with snow summit in foreground from Rishi Kot.  
Below: Camp 1 with Nanda Devi (NW Face) behind.



leaving the snow along the top untouched. The only consolation for the defeat was the splendid view. Looking north along the ridge they could see the granite spire of Changabang and the steep snow slopes of Kalanka. Looking south west they could see the snow ridge that led up to Rishi Kot. On the opposite side and beneath them there was the giant Ramani Glacier, and further away the cliffs of Dunagiri.

On the descent, Mark lost his balance and tumbled 200 ft. throwing snow about him as he went. Fortunately he stopped when his crampon caught in a rock at the bottom of the snow slope. He was a lucky man. A very slow descent followed in which Mark needed a lot of protection as he was bruised and shocked, though thankfully all parts were in working order.

The second attempt was conversely stopped by one of the worst days so far, in which a great blanket of snow cloud rolled in, blocked out the sun, and made climbing very unpleasant and wet. This attempt was a climb straight up the face beneath the summit and involved a lot of pitched rock climbing - which was slow work, even in two ropes of two - Mart and Tim and Dave and John. The summit almost certainly would have been reached but it was too cold to go on. Their actions and thinking were being slowed down so they reluctantly decided to return. A few abseils speeded the return, but Dave, obviously very tired, rolled down 150 ft. of gentle sloping snow to the bottom, when he tripped over his crampon. It was a quicker way down, avoiding any possible problems with the bergschrund and hopefully he would have a hot mug of tea waiting at camp for those climbers who had used more orthodox methods of descent.

The third attempt was successful. John and Tim found a third way up the fact to gain the ridge, closer to the summit than the first attempt, and where the ridge was in better condition. A simple walk led to the top, but the altitude necessitated a two-minute pant every fifty steps.

The snow on the face was poor and the ice beneath was that crumbly mixture that would neither take a dead man, ice screw or ice peg effectively. On the ridge it was easy to move together. The summit was gained, where they rested, sitting on their rucksacks, peering into the whiteout, and imagining the splendid views they might have seen.

In the early morning sun of the following day, they could pick out their footprints and convince themselves that they really had reached the top. The 'warm-up' for Rishi Kot proved to be a much bigger venture than had been bargained for!



Ascent of Rishi Kot

Tim Hurrell

From Camp 1 Rishi Kot looked its worst. Its shapeless mass rose almost reluctantly from the glacier to the West of Camp 1, up to its top snow ridge. White snow fingers found indistinct paths down between shattered rock ribs, some reaching right down to the glacier to touch the piles of avalanche debris that stretched up to meet them.

The first attempt was made by Mart, Dave and Mark. They tackled an ill-defined rock ridge that led up to the summit from a point below Camp 1. Although they moved together, progress was slowed by the loose and dangerous rock that threatened to fall apart beneath every step.

With the weather closing in, as it almost invariably did in the afternoons, they reluctantly agreed to return. Almost immediately the rope dislodged a rock that fell and caught Dave a hefty blow on the knee. They continued down but much more slowly, with Dave in great pain as the bruise stiffened up, and were thus forced to bivouac. They had a cold night, made colder by the defeat.

They reached Camp 1 in the morning where they ate breakfast and the previous night's supper in quick succession and Dave had a chance to rest his leg.

Tim and John were now keen to try an alternative route up a snow gully which had been reconnoitered earlier when Camp 1 was first established. An incident then illustrated again how dangerous the snow conditions were. One of the recce party dislodged a large slab of snow, which funnelled into the gully taking all the snow (but fortunately no people) with it - the soft monsoon snow had not bonded to the frost-compacted winter snows. This gully having avalanched once now had little snow and seemed unlikely to avalanche again!

Tim and John made quick preparations and left after lunch, carrying with them a small, light snow shovel with which to dig a snow hole. They climbed the gully quickly, but digging the snow hole took a long time due to the presence of hard ice-bands, so even by nightfall the hole wasn't really big enough. However they had a cosy night, even if it was slightly damp.

In the morning the sun broke loose from the jagged Eastern horizon to reveal a cloudless sky and a hazeless day. The climb had begun. They quickly gained the ridge and looked over and onto the great sweep of the Ramani Glacier beneath. That side was much steeper than the Camp 1 side.

The snow was hard and compact, ideal for crampons, which made a very pleasant change from the softer snows lower down. They almost walked up, keeping off the exposed ridge and on the less steeply angled slopes to its left. The surrounding mountains were so impressive that they almost ran rings around each other in attempts to compose photographs with their climbing partner suitably positioned to



display to best advantage the splendid backdrop of rock and snow peaks.

They gained the summit only to find that a long and contorted ridge led up and down to a point only a few feet higher. The ridge was now heavily corniced, bending and sagging with icicles beneath. They gingerly walked along the top roped together, but belaying with deadmen on those sections where the ridge looked too weak for comfort.

Finally they reached the summit nodule - a fifty foot wall of soft snow. At the base there was a convenient belay point - an ice dome - and with this for added confidence they climbed up, kicking well into the soft snow.

They were there, but unfortunately they were not the first. Someone, as yet undiscovered, had unofficially beaten them to it and left a couple of cans to prove it. That was the only mar on an otherwise perfect day. The weather had held for the first time and all around them was a sunlit panorama of black and white peaks.

They stayed a long time, enjoying the many different snacks that made up their lunch. By the time they returned the snow had softened and at one place John fell through the cornice, so Tim jumped off the other side. They both ended up in deep snow with the rope never having become taught.

Mart and Mark, as the second assault party, met them at the snowhole and gave them a welcome cup of tea before they returned to Camp 1. The weather held for a second day, so by following the frost-frozen footsteps Mart and Mark had no trouble reaching the top, arriving much earlier than the first pair.

So despite being a crumbly mass of rock, Rishi Kot had provided an interesting snow ridge and some splendid panoramas. It was a pity we were not the first to reach the top, and a pity we had taken so long to do it ourselves, but reaching the top more than justified all the work and effort all the expedition members had put in, and continued to put in, before everyone was safely back in England.

The final instalment of an everyday story of crazy people. or 'the return'

Martin Gledhill

On the 25th August we took the tents down at base camp for the last time and went through the dreary task of ferrying everything back across the river. We had been expecting the porters to arrive the same day, or even the day before, but there was no sign of them so as a precaution, since they had a plane to catch, Tim R., Dave and Mark set off down the gorge with Bal Singh - the one porter we did have left. The rest of the porters arrived the next day, so we followed a stage

behind the first group. Just over the South Rishi river at Gupa the porters complained that they were carrying too much, so to settle the argument we made a makeshift balance from the remains of Tim R.'s bamboos and a couple of bootlaces, using as a reference 25 litres of water. Much to our embarrassment, the man who had been the most vociferous in his complaints, and who had been given an extra rope to carry for his pains, did indeed have too much ..... one rope's worth in fact. A couple of the other loads were over too, so we divided the extras between us and carried on. Both parties made good time in reasonable weather, expecting at any moment to be trampled underfoot by a huge Jap expedition, reported by Kunwar Singh to be marching up the valley with 100 porters and 600 goats.

By the time we all met up at Dibrughetta we had seen no sign of the oncoming hordes and the next day, in a mammoth effort and appalling weather knocked off the last four stages back to Lata. Somewhat overcome by this, we spent the night in one of the porters' houses, eating fried chapattis and drinking rakshi (the local moonshine), and we were hard-pressed to make it to the bus the next morning.

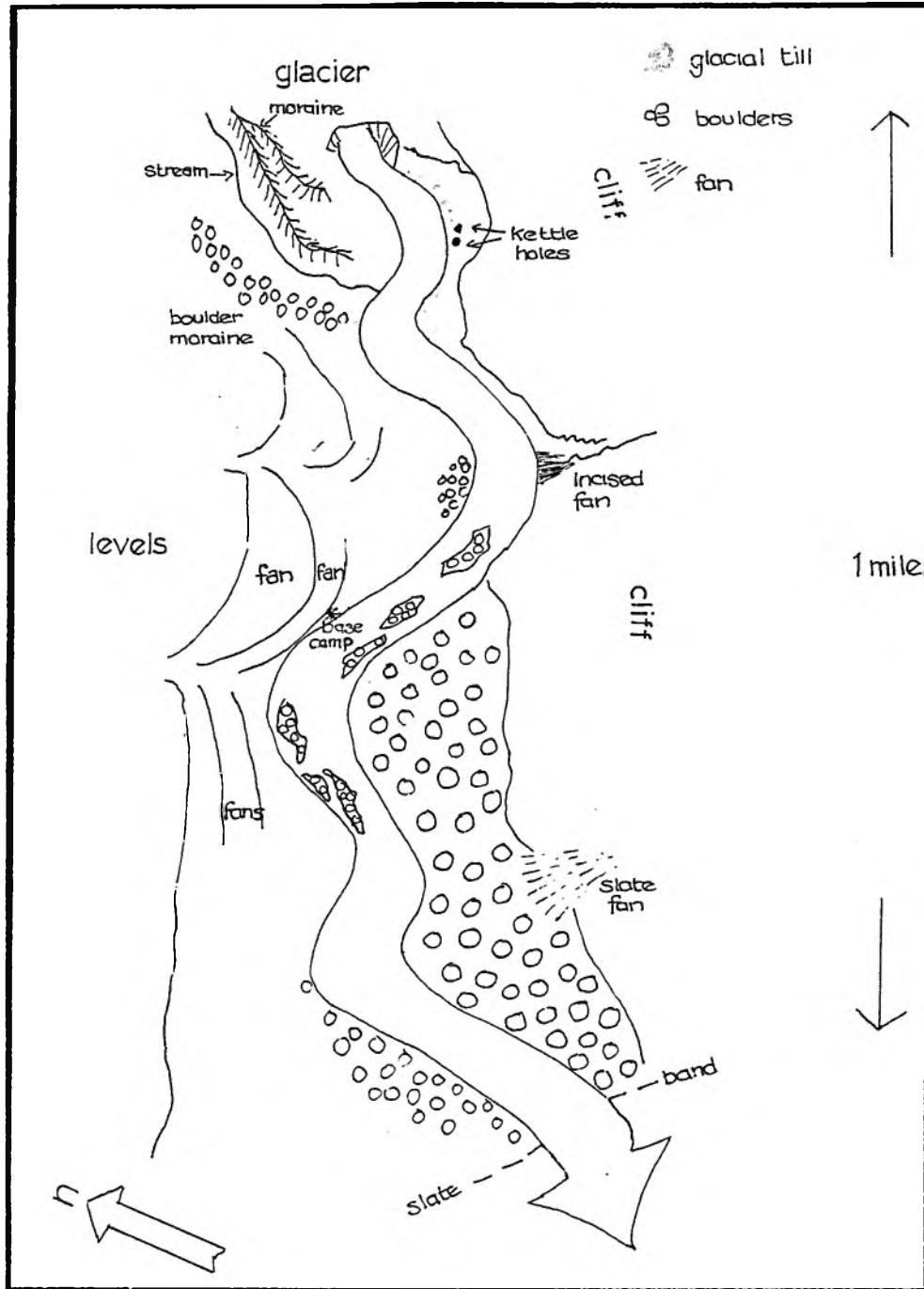
Tim H., Jenny and John stayed on at Joshiemath, because John had developed an ugly abscess on his ankle and could not now walk. The others set off straight away for Delhi, returning there in a decidedly worse state than when they had left. Tim R. still had the diarrhoea that had accompanied him throughout, Mark's legs were starting to swell and go puffy, and Dave was recovering from an infected throat while simultaneously developing Delhi Belly. All three were in fact quite ill when they got back to England - Dave spent three weeks in isolation in hospital, with a serious kidney infection, Mark was confined to bed for a similar period and Tim R. had to take twenty of the most powerful hunger-uppers that the Institute of Tropical Medicine could supply. Meanwhile, back in Rishikesh, John too had a week in hospital while his ankle was lanced and healed.

Suffering only from too many cheap bananas Tim H., Jenny and Martin went off to Kashmir to recuperate.

SCIENTIFIC REPORTS

The geomorphology of the North Rishi valley

Tim Reed



The valley can be conveniently divided into two units for study: the lower riverine unit and the upper glacial unit. Of the two the latter is by far the biggest but allows one less chance to piece together the valley's recent history compared with the area free from glacial cover.

The lower section can itself be subdivided into two units divided by a band of slate and wacke. In the lower unit the river flows in a small gorge for half a mile to join the South Rishi Ganga. Above the band is the area studied. The band has acted in the past as a block to erosion, with valley sediments graded to the level of this obstacle, and it is likely that it has only been breached within the last few thousand years.

Between the band and the tongue of the glacier is an area of glacial and fluvio-glacial deposits. The valley is carved out of dipping sedimentary and metamorphic rocks with obvious bedding and jointing. On both sides are steep cliffs and bluffs fronted by scree and talus deposits. On the southern side some of these screes have been activated by river undercutting, in contrast to the well vegetated screes on the northern side of the valley.

Dominant in this section of the valley is the outwash river from the glacier. Following a winding course it undercuts and attacks the southern valley side for much of its way, cutting into and destroying older glacial deposits which can only be seen on the northern slopes. Here one can view old levels formed during a previous higher glacial epoch from lateral deposition of glacier-carried debris and from freeze-thaw action on the cliffs above. These are on a par with the height of the Changabang glacier upvalley which, though now stranded above the present glacier, was once part of a larger, joint glacial system. The levels form semi-level platforms vaguely traceable on the southern slopes and have been cut by streams initiated higher up the bluff line, where an igneous intrusion provides an impermeable band stimulating spring formation. The steep slope above the levels has caused the streams to cut deep gullies through them. This detritus has been spread in the form of fans onto the flat land formed by river-deposited glacial debris. There appear to be 3 phases of fan building, each about 15 feet above the other, with fans from the separate gullies coalescing. The most complete is the present fan grading down to just above the present river level.

The river itself is in the throes of both erosion and deposition and appears to be cutting down into earlier deposits in accord with the lowering of the local base level now that the slate band has been breached. The main feature of the river is its boulder load. The material transported is rapidly altered from angular fragments near the glacier snout to rounded units half a mile downstream. The commonest component of the debris load is the granite from the Changabang and upper North Rishi glaciers which survives well due to its hardness, in contrast to the easily fractured sedimentary rocks. As the river has shifted sideways a large, granite dominated, boulder train has been left and the river cuts into softer unconsolidated fan debris before switching across to the gap in the slate band.

The steepest river gradients are in the areas of braiding which start near the fan section and continue to halfway down the boulder train.

Only near the glacier snout with its cavern front do glacial and pro-glacial landforms dominate. For several hundred yards in front of the snout there is an area of glacial debris. Again, this is mainly on the north side, since the snout and river open near the southern valley wall where the only features are small active screes from the near-vertical cliffs, and kettle holes, depressions left by the melting of blocks of ice in the glacial debris.

On the northern side the deposits cover a wide area and are more glacial than fluvio-glacial. At the front is an area of unconsolidated debris or 'till'. Beyond this are till deposits put down within holes and cracks in the glacier and these form debris-covered, ice-cored, knife-edged ridges. Beyond these is a true lateral till deposit and this lateral moraine extends right up the valley, paralleled by one on the southern side.

The second, and larger unit of the valley is the glacier. At the moment the glacier is in a period of retreat and stands below all the other glaciers in the basin, except the North Nanda Devi Glacier (NNDG). The other glaciers have retreated into small basins blocked by terminal moraines which are breached by meltwater streams flowing into the main glacier. The glaciers from Mangram to Nanda Devi all contribute grey sedimentary/metamorphic rocks, while the tills from the upper North Rishi Glacier (NRG) and, in particular, the Changabang glacier, produce distinctive white granite. Changabang glacier sits perched above the main valley on a 400 ft. high moraine and gives rise to Changabang river. This flows parallel to the NRG and only breaches the high lateral moraine near its snout. The Changabang river has graded itself way above the present level of the NRG which sits 100 ft. below the lateral moraine.

The NRG is covered with debris which cuts down ablation loss but still indicates a retreating or stagnating glacier. Further evidence is seen in the occasional areas of grass growing towards the snout on the heavily seracced surface. With so many corrugations and the hot sun, any areas not debris-covered are swiftly melted. Surface pools are common and are drained as the ice moves and fissures open. The junction of the NRG and NNDG shows the main supplier of debris to be the NNDG with its darker debris load.

All the meltwater streams from perched glaciers and from NRG itself are discharged from a cavern at the glacier snout. Here daily change due to movement in the glacier is very evident. While we were at base camp the snout, with its strongly banded ice, collapsed and changed form a number of times. The collapses temporarily block the flow to pond back the river within the cavern. Ice surges

occurred several times when this dam broke, and an ice dam with a lake behind it was observed on the day the expedition left.

It is likely that the area would be worth visiting by a team of geomorphologists and glaciologists; the glacial and fluvio-glacial features of the valley are of a diversity and scale not met with in Europe and show a great deal of variation within a relatively small area.

Ornithological programme

Tim Reed



Above: Brown flycatcher caught in the North Rishi valley.

As is often the case in bird projects not everything went quite to plan but nonetheless much valuable work was undertaken and completed. The first phase was the ringing and biometrics study at the foot of the Himalaya range. Upon arrival at our recommended site at Mukteswar we found the area unsuitable for bird netting. We were, however, recommended an admirable site on the Government sheep farm at Pashulok near Rishikesh. Here there was a wide range of habitats, including gardens, littoral vegetation, lime groves and a stream with relict riverine forest.

Each of the habitats was netted in turn with a concentration on the lime groves with their good undergrowth of annual herbs. Here the conditions were excellent as the tree tops were at the same height as the net tops so that average flight height was well within netting range. Over a period of seven days 400 birds were caught, the majority in the lime area. In total 41 species were caught. The Baya weaver, being caught in large flocks, was the most frequently netted species.

Every bird caught was first identified and then where possible aged and sexed, examination for brood patches helping in this. Details of body weight and wing length were recorded and details of feather growth in birds undergoing wing moult. Also where rings of suitable size were available, birds were ringed as part of the Indian Bird Ringing scheme. 169 birds of 31 species were ringed. It is hoped that some of these will be recovered later either locally or at distance and indicate the minimum length of time species live, and the distances flown in wandering or migrating. All details of the measurements are being sent to the Bombay Natural History Society and more comprehensive details can be found in a paper to be submitted to the Journal of the Society.

The netting programme, worked in conjunction with cloacal swab collection, was not without incident. Nets were damaged on several occasions. One was run through by a holy cow, and another two nets on the edge of the jungle were destroyed by a herd of water buffalo. Timely intervention stopped a fourth net being stolen for use in catching fish in the nearby Ganges. The would-be thieves, in their haste to escape, left behind the partially dismantled net, their fishing poles and footwear.

Due to misinformation about the vegetation in the North Rishi valley, it was not possible to make a study of comparative tit ecology. Instead much more time and energy was concentrated upon the examination of the avifauna of the area and, in particular, attempts to find nests and obtain proof of breeding in the area. Few observations have been made in the region prior to this expedition.

The dominant vegetation in the valley was scrub juniper. In areas of deeper soils or lower angle slopes a better grass and herb cover was found and scrub willow followed the lower reaches of streams. Vegetation was therefore low and sparse enough to cause problems in hiding nets. Netting was further hindered by frequent rain and drizzle and by the dominant up-valley wind which blew all day except for a few hours at dawn. However, 6 birds were caught: 4 rose finches, a Tickell's warbler and a brown flycatcher.

The catching is of interest on two counts: firstly netting is rarely attempted at such altitudes (15,500 ft.) and secondly the warbler and flycatcher

were both in a condition suggesting breeding. The warbler (Phylloscopus affinis) was caught near its nest and a ringed parent was later observed feeding its brood of four. The flycatcher (Muscipa sibirica) was far beyond its usual documented range. It had evidence of a brood patch, rather than a juvenile's wrinkled stomach, and good wear on the tail and primaries. It is possible that it was breeding in the valley although far above its usual range, or possibly moving to lower altitudes, having crossed over from Tibet. Three of the four rose finches were common rose finch ♀; in all cases brood patches had begun to fur over, signifying a post breeding condition. The fourth bird was a male. All six birds caught were ringed and it is hoped that one of them might be found in their lowland wintering quarters.

Five species were proved to be breeding in the valley: white capped river chat (Chaimarrornis leucocephalus); Tickell's warbler; black redstart (Phoenicurus ochruros); Himalayan rubythroat (Erithacus pectoralis) and rose breasted pipit (Anthus roseatus). For the first three, nests were found and young seen, in the case of the riverchat a great amount of detailed observation was possible and this will be published along with more detailed records for the valley. The pipit and rubythroat were both seen feeding newly fledged young. Also of note was the finding of 3 nests with young of the house martin (Delichon urbica) under a cliff underhang at 16,500 ft., a day's walk down the Rishi gorge.

43 species were observed, 20 being the daily average. Several interesting observations were made. The two species of chough in the valley intermingled freely, unlike in Nepal where they are infrequently observed together. Often the aerial 'games' and feeding parties of the yellow billed chough (Pyrrhocorax graculus) were led by small numbers of red billed chough (Pyrrhocorax pyrrhocorax). A lammergeier (Gypatus barbatus) was several times observed bone dropping from several hundred feet then wheeling down to collect the bone and repeat the process before the bone was sufficiently broken to allow access to the marrow.

By the end of the period at the base camp many of the migrants had started to leave, especially noticeable was the exodus of the valley population of Tickell's warblers. By the third week in August numbers were diminishing and few family groups were to be seen in comparison with the many fledglings being fed in the few weeks before. Mixed warbler flocks became common with greenish warblers (Phylloscopus trochiloides) moving down the valley in the early morning through the juniper scrub - the first time greenish warblers had been seen in the valley. Also observed for the first time were hoopoes (Upupa epops). Singles and pairs were observed high up on the glacier margins suggesting, like the greenish warbler, passage over the divide from the Tibetan plateau. They were also observed passing down the Rishi gorge as the expedition left the area.



Of special interest was that many species were observed near or beyond their documented altitudinal range, as seen below:

spp.	Fleming's height range	Max. observed height (or range)	variation c.f. Fleming
golden eagle	7,000 - 15,000	14,500	
Himalayan griffon	5,000 - 20,000	14,500	
Lammergeier	4,000 - 24,000	14,000	
shahin falcon	400 - 7,000	13,500	+ 6,500
eurasian kestrel	5,000 - 14,000	14,500	+ 500
Tibetan snowcock	12,000 - 18,000	17,000	
snow partridge	10,000 - 17,000	17,000	
snow pigeon	5,000 - 16,000	13 - 16,000	
hill pigeon	6,500 - 17,000	17,000	
hoopoe	400 - 19,000	13 - 15,000	
house martin	1,000 - 15,000	15,000	
red billed chough	8,000 - 18,000	13,500	
yellow billed chough	12,000 - 27,000	13 - 16,000	
brown flycatcher	900 - 4,500	13,500	+ 9,000
Tickell's warbler	500 - 16,000	13 - 14,500	
smokey leaf warbler	500 - 15,000	13,500	
greenish warbler	900 - 14,500	13,500	
Himalayan rubythroat	900 - 17,000	13 - 14,000	
black redstart	5,000 - 15,000	13,500	
blue fronted redstart	2,500 - 16,500	13 - 17,000	+ 500
Guldenstadt's redstart	9,800 - 18,000	14,000	
white capped river chat	800 - 16,000	13 - 14,500	
plumbeous redstart	2,500 - 13,500	14,000	+ 500
blue rock thrush	400 - 11,000	16,000	+ 5,000
whistling thrush	700 - 15,000	13,500	
wren	8,500 - 15,000	13 - 15,000	
brown dipper	1,500 - 15,000	14,500	
alpine accentor	8,000 - 18,000	13,500	
rufous breasted accentor	6,500 - 16,000	13,500	
wallcreeper	1,800 - 15,000	13 - 15,500	+ 500
Hodgson's tree pipit	900 - 12,300	14,000	+ 1,700
upland pipit	4,500 - 9,000	13 - 14,500	+ 5,500
rose breasted pipit	2,500 - 16,000	14,500	
pied wagtail	400 - 14,800	13,700	

spp.	Fleming's height range	Max. observed height (or range)	variation c.f. Fleming
white winged grosbeak	7,000 - 14,000	14,500	+ 500
Tibetan twite	13,500 - 15,000	14,000	
Hodgson's mountain finch	7,000 - 17,000	13,700	
common rose finch	800 - 12,900	13,500	+ 800
Nepal rose finch	4,500 - 14,500	14,000	
Eastern great rose finch	8,000 - 15,000	13,500	
juniper finch	8,500 - 13,000	13,500	+ 500
red breasted rose finch	8,500 - 13,000	13,000	
rock bunting	7,000 - 14,500	13 - 14,000	

(N.B. Fleming = Fleming, R. L., Sr. & Jr. 'Birds of Nepal' 1976 pub. Kathmandu)

Further details of valley observations plus those in and around Joshimath will be found in papers to be submitted to the Journal of the Bombay Natural History Society.

Note: The following papers have since been accepted by the Journal:-  
 "A contribution to the ornithology of the Rishi Ganga Valley and the Nanda Devi Sanctuary."  
 "Feeding behaviour of the white-capped riverchat, Chaminaromis leucocephala."

#### Vegetation studies

Tim Reed

A short study was undertaken to see if vegetation type within the valley differed in response to environmental conditions. The starting hypotheses were that the availability of water, continual deposition of debris, and flooding from the river would affect plant numbers and distribution.

In order to test these hypotheses an area near the camp  $\frac{1}{2}$  mile downstream from the glacier snout was selected. This included an area of 'fan' where a steep gully spilled out mainly fine debris on to a shallow slope, that spread down to the river bank.

The vegetation was sampled using one metre square quadrats. These were placed within a grid of 9 equally spaced parallel transects running at right angles to the river and parallel to the trend of the fan. Within each quadrat the following were recorded: the soil pH and wetness; the area of plant cover; the

species present with the number of plants and the percentage area occupied by each; and the presence or absence of boulders within a quadrat. The last measurement was included because of the rock nature of the fan and surrounds. A detailed description of each quadrat was recorded, including the slope, the colour and texture of the soil and the proximity to any of the several streamlets on the fan and surrounds.

The data indicates that the vegetation pattern varies distinctly. In particular, from the linking of certain species to environmental variables, one is able to distinguish 'indicator species' which dominate in certain environments.

Fine damp open fan soils which have recently been disturbed are commonly dominated by mugwort. Damp soils nearer to ephemeral water supplies are dominated by 'spikey blite'\*. Quadrats near a permanent water supply tend to have a denser vegetation cover of perennials rather than the annuals common in less stable conditions. Immediately adjacent to stream lines scrub willow is typical with alpine willowherb (Epilobium latifolium) further away, and such quadrats tend to have many species in contrast to the dry fan sites. Where willow is absent by stream banks a community of willowherb, clubrush, mixed grasses and cranesbill is common.

From a preliminary analysis it seems that the degree of soil disturbance, the availability and permanence of water, and the nature of the soil are the important factors affecting plant distribution. A more detailed examination of the relationships is being undertaken.

\* Definitive species identification is not yet complete.

FACTS AND FIGURESTransportation

Mark Pezarro

Transportation of people and equipment accounted for a major portion of the expedition's expenses. It was decided early on that the members would travel by air to Delhi and from there by public transport to the roadhead at Lata. Although sea freight and overland shipment were also considered, air freight was finally chosen as the means of transporting the equipment and supplies. A number of freight forwarding agencies advised us that commercial overland shipment was not reliable enough. Sea freight would have required assembling all our equipment at least two and a half months in advance of our desired arrival date in India; a deadline we could not have met.

There is a good deal of competition for passenger traffic to India and ticket prices vary considerably. I contacted all the travel agencies I found advertising in various national papers and magazines and asked them for quotations. The cheapest carrier was Ariana Afghan Air (through Flamingo Travel of London) at £212 per person, considerably below the standard IATA fare of £290.

By stretching the regulations a bit we had our freight sent as unaccompanied baggage. This was done through a freight forwarding agency, East Anglia Forwarding of Cambridge, who for a small surcharge (£26) picked up the freight for us in Cambridge and took it out to London Heathrow. Having our freight classified as unaccompanied baggage meant we paid £1.12 per kilo rather than £1.92 which is the standard IATA freight rate.

Numerous people and organisations were contacted in an effort to obtain free or concessionary transport for our freight but none proved successful. My conclusion is that unless an expedition is a really big one or is fortunate enough to number among its members someone with influential contacts in the transportation industry, no-one will be interested in helping in this way. We did, however, get a small concession from the airline. After I spoke with the manager in London we were given an extra 5 kilos of personal baggage allowance and a promise that our unaccompanied baggage would be sent on the same flight as us. Normally the airlines only undertake to ship unaccompanied baggage at their own convenience.

Food organisation or 'how not to make the mistakes we did'

Jenny Williams

We had a number of problems with the food on the expedition and, although happily nobody starved, the following hints and details of what we did will, I hope, be of use to future expeditions heading in the same direction.

There were two reasons for most of our problems. Firstly we had to take the minimum possible, because of the cost of air freight and porters. We took about 160 kilos of food out from England and bought the rest in India. Secondly, we took all the food as one job lot rather than split into x-man-day packs. This was definitely a mistake and resulted in days wasted at base camp sorting out 8-man day packs to go up to the high camps, and extra effort for the climbers in having to keep a check on the number of days' rations left. Indeed, because of this the cooking was often restricted to those who knew how many spoonfuls of Smash served two people, or how many man-days there were in a packet of apple flakes!

The quantities were adequate but it was generally felt, (and voiced!) that people could have eaten more. However, everybody "got used to" the rations and the only real shortage occurred when Martin tried to make Smash out of milk powder at one of the high camps, leaving them milk-less for several days!

There wasn't a great deal of variety in the food. Lunch was made a great deal more acceptable when accompanied by chapattis. Those at high camp became desperate for a change from packet cheese for lunch and apple flakes for supper, while those at base camp became desperate for a change from tinned fish and rhubarb, rhubarb, rhubarb - which abounds wild in great clumps in the valley. Martin built a superb oven but it was only used on a few occasions when the climbers returned to base camp and we had a huge gourmet "nosh". Overeating at one of these noshes resulted in camp becoming a hospital for a day. It was surprising what we managed to make with a little ingenuity. The goodies ranged from Martin's excellent scone, and shepherd pie with garlic potato, to Cornish pasties (pastry hammered out with the fist on a flat rock), luxury trifle and (need I say it) rhubarb crumble.

We cooked solely on open fires at base camp and were able to do this because the juniper scrub in the valley had been flash burnt, and was therefore dead, dry and suitable for burning. We used a mixture of "primi" and open fires on the walk-in, but of course used kerosene continuously at the high camps. We were able to buy both kerosene (paraffin), and containers to put it in, in Delhi.

Food was transported in large plastic fertiliser bags and anything not tinned was further wrapped in several layers of polythene bags. An ample supply of both would be well advised. Very little food perished, only some boiled sweets which got wet and went soggy, and peanuts which were eaten in the tent by mice (we

stopped this by putting the nuts in closed plastic boxes). The Mars bars got pretty beaten up in the goat loads but were still edible. One food dump did get attacked by animals - a hole was chewed in the side of the fertiliser bag and all the sweet stuff was selectively eaten. We found our 10 litre plastic boxes with lids from DRG extremely useful, as ongoing food storage boxes, washing-up bowls, and the lids were even useful for fanning the cooking fires.

Of course, when you are taking porters with you they have to be fed as well, and for the sake of good relations it is essential to make sure you have enough food for them. We had problems with this as well when we found we had not enough food; approximate quantities are given, but the ration we actually gave varied considerably. It would be wise to establish a ration with the sirdar right at the start of the trip and buy accordingly. A day or so's spare food would also be a good idea in case the party is delayed, as we were, by bad weather. On the walk-in we took all the porter food with us, and gave food for the way out as and when each porter left us. While in the Sanctuary our high altitude porter ate the same rations as us. For the walk-out the porters brought more food in with them, dumping enough at the camp sites for the way out again.

#### Food bought in Delhi

Salt	Tinned cheese
Sugar	Tinned meat roll
Porridge (Wheat Dalia Fried)	Tinned sausages
Tea	Dried Soya Protein (Nutri Nugget)
Sweets	Toilet roll
Dried fruit	Wash powder
Rice	Washing-up powder
Custard powder	Matches
Marge (HVI or ghee)	
Marmalade	
Jam	
Jelly crystals	
Sweet biscuits	
Tinned fish	

Food bought in Joshimath

All porter food

Flour

Extra rice

Extra sugar

Extra coffee (Nescafe instant)

Extra milk powder (very expensive in India)

Extra tea

Useful addresses

Super Bazaar  
Connaught Circus  
New Delhi  
India 'Phone 40163

Empire Stores  
Connaught Place  
New Delhi  
India

The Dried Fruit Mart  
Connaught Circus  
New Delhi  
India

Kanhya Lall Kishori Lall  
1340 Qutab Road  
Delhi 110006  
India

Select Industries - (These are supposed to be  
AB - 14/B specialists in supplying  
Safderjung Enclave mountaineering expeditions.)  
New Delhi 110016

We bought all our food from Super Bazaar, Empire Stores and the Dried Fruit Mart.

Porter rations - approximate

Rice	500g/day/man	)	
Flour	500g/day/man	)	We sometimes gave less than this.
Dal	1 kilo/day/10 men	)	
Chillies	100g/day/10 men	)	ample
Other spices, e.g. marsala	100g/day/10 men	)	ample
Oil	1 kilo/5 days/10 men	)	We had to give ghee extra to this
Tea	100g/day/10 men	)	
Sugar	5-600g/day/10 men	)	Chai is important. We had to
Milk powder	100g/day/10 men	)	skimp on these at times, with
Cigarettes or bidis	1 pkt/day/man	)	disastrous results.
Matches	1 pkt/2 days/man	)	essential
Suji	This is an extra, and our porters didn't seem to know what to do with it. We took 2 kg. for the whole trip. It was used once and in fact was delicious, but you need plenty of sugar to cook it.		

The porters also liked especially our ghee (margarine), Mars bars and sweets.



Our rations - an 8-man-day pack contained:Breakfast

4 packets Rise and Shine

600g uncooked porridge

OR

1000g Jordan's muesli

- Indian porridge is best boiled up the evening before and left to soak overnight.
- nice with hot milk.

Lunch

8 Mars bars or Marathons

8 x (3 x 1 oz) portions Anchor

OR

2 x 500g tins, e.g. mackerel,  
salmon, processed cheese,  
pork luncheon meat or ham roll

- useful for climbing as lightweight, and for odd-numbered parties where division of tins is difficult.
- tins were mostly eaten at base camp. Indian salmon is cheap but isn't salmon.

2 x 250g packets of sweet biscuits

OR

3 x small packets Marie biscuits

- these can be bought by the tin (45 pkts) in India. They are cheap and very popular. The tins also make a good oven.

8 x 4 boiled sweets

8 x handful of nuts

8 x handful of dried fruit

Supper

1/6 catering tin of soup

1 pkt Batchelors dried meals

½ pkt Nutri nugget

(this is much cheaper than  
Batchelors)

dried vegetables

- these cooked OK at the high camps
- excellent stuff; can be used alone with soup and dried vegetables if necessary. (Empire Stores)
- about 3 times the quantities advised

1/5 catering Smash tin

OR

1 kilo rice

- empty Smash tins make good lightweight billies
- ample

Wild stewed rhubarb

OR

Apple flakes

- we used twice the quantities advised and this was not very generous.

OR

$\frac{1}{2}$  catering pack Instant Whip

- not a very generous helping.

Custard powder

Cocoa

### Other

Matches

- beware Indian matches which go damp terribly easily.

$\frac{1}{2}$  kilo milk powder )

800g sugar )

- we would have liked to have more.

Salt

- we used 3 kilos the whole trip.

Tea

- we used  $2\frac{1}{2}$  kilos the whole trip.

Coffee

- we took 1 kilo and could have used more

Toilet paper

- Indian sheet stuff (Empire Stores) is much cheaper than rolls and is very useful for pressing wild flowers and cleaning camera lenses!

Spices )

Washing powder )

Washing-up powder )

Scrubbers )

J Cloths )

- we had all of these at base camp, but used little of any of them.

Equipment

Martin Gledhill

The aim of this section is not to give a comprehensive breakdown of everything we took but rather to provide some notes on our experiences with a few items.

Tents: We took seven tents: 1 Vango Mk. 5, 1 Vango Mk. 2 (both cotton), 2 Ultimate Equipment 'Montane', 1 Ultimate Equipment 'The Tent', 1 Rafma and one small nylon hike tent. The Vango Mk. 5 was borrowed from the BMC gear pool and was used mainly as a store for food, toilet rolls and other perishables. The occasional occupant of the tent certainly lacked no essentials. Ultimate Equipment provided us with three tents at cost price. The 'Montane' is a low-slung tent, with a large bell at one end - excellent for cooking and storing gear in - and a small bell at the other, where small items of climbing gear can be safely stowed. We found this model difficult to pitch well, and although it is supposed to sleep two, this makes it very cramped and gives excessive condensation. The condensation problem is accentuated by the low centre section, where it is hard to avoid pushing the inner against the fly. 'The Tent' on the other hand, was delightfully easy to erect and very roomy, sleeping two in comfort and three if necessary (one night at Camp 1 we slept four in it). Each end of the fly has a large bell, and the only improvement we could suggest would be moving the zips from the centre of the end panel to the corners. For snow camping the Rafma is very good, and its hoop shape gives a lot of room inside. However it is not a very lightweight tent and the poles are awkward to carry.

Boots: Two members of the expedition bought 'Makalu' double boots, which they used above base camp. The conditions which we experienced were probably not those for which the boots are intended, since we had more wet than cold. This led to the felt inners getting damp and they took a long time to dry out.

Sleeping bags: We all had sleeping bags of various qualities, from the Daimor 'Sheidegg' to the Mountain Equipment 'Redline'. The Shiedegg was not sufficient for use for prolonged periods above the snowline, and for those with better quality bags a second bag of lesser quality or with a synthetic stuffing would have been useful for the walk-in and out, as the frequent rain made it difficult to keep the good bags dry.

Thermal wear: Damart supplied us with several sets of 'Thermal Underwear' and gloves, mostly seconds and thirds at reduced cost. The underwear was warm and easy to dry if it got wet. However beware of getting the material too close to direct heat when it goes hard and brittle. The gloves were cut on the small side and very close fitting to the hand. This was probably one reason why they did not stand up very well to hard wear.

Stoves: We used Primus stoves exclusively, and had no problems with the altitude or the local paraffin. At base camp there was plenty of dead juniper scrub which we used to build cooking fires, however we bought a couple of cheap 1 pint paraffin stoves in Delhi in case this was not available. We also bought a hurricane lamp in Delhi which was very useful at base camp (needless to say a spare glass or two should be taken).

Ropes: We took a variety of 9 mm. and 11 mm. Kernmantel ropes. It would have been a good idea to have had a few lengths of cheaper quality rope as well, for fixing on the roped sections of the walk-in and for constructing our rope bridges.

Tarpaulin: Yashi lent us a lightweight tarpaulin given to him by a previous Japanese expedition. On the walk-in the porters often used this as a shelter, and at base camp we made an excellent eating/cooking shelter from it.

Rucksacks: Again we had a variety of these, almost all of Karrimor origin. For carrying heavy loads a frame is indispensable of course, and Karrimor's 'Orienteer' model is particularly good. We were grateful to have had a spare sac with us.

Porter Equipment: A high-altitude porter will expect to be equipped with boots, a rucksack, warm clothes and possibly even a sleeping bag. He will also hope to be able to keep some of this equipment as 'Baksheesh' but as we supplied our high-altitude porter from a combination of our own personal equipment we were unable to allow him to keep much.

Snow shovel: Yashi also lent us a lightweight snow shovel which was used to great advantage to dig the snow hole used in the climbing of Rishi Kot.

FINANCESIncome

Personal contributions	£ 1400
The Vincent Wildlife Trust	500
The World Health Organisation	300
Mount Everest Foundation	200
Mr. Pezarro	200
Mary Euphrasia Mosley Fund	150
Cambridge Expeditions Fund	150
British Mountaineering Council	100
The Worts Travelling Scholars Fund	75
St. Johns College	60
Selwyn College	50
Gilchrist Educational Trust	50
Carr's Flour Mills Ltd.	10
Schweppes Ltd.	10
Cleveland Bridge Co. Ltd.	10
Molyslip Holdings Ltd.	10
	<hr/>
	£ 3275

Expenditure

Air tickets	£ 1470
Food	500
Equipment	160
Postage, printing, etc.	100
Air freight	350
Travel in India	100
Peak fee	130
Porters	470
Guest houses, other expenses in India	80
Insurance, miscellaneous	300
	<hr/>
	£ 3660

The deficit will be made up by the members, and by selling the equipment no longer needed.

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Damart Ltd.	DRG Plastics
Empire Dairies Ltd.	Farillon Ltd.

Fibrenyle Ltd.	Field & Trek (Equipment) Ltd.
Fisons Ltd.	G. & H. Products Ltd.
Gill & Duffus Ltd.	Gillette Industries Ltd.
Gra-Bor (Plastic Containers) Ltd.	Jenks Bros. and Schwartz Spices Ltd.
W. Jordan & Son Ltd.	Manley Ratcliffe Ltd.
Mentmore Manufacturing Co. Ltd.	Morning Foods Ltd.
The Prestige Group Ltd.	Rank Hovis McDougall Foods Ltd.
Ronson Products Ltd.	Rotunda Ltd.
Rowntree Mackintosh Ltd.	Scottish & Newcastle Brewery Ltd.
Secto Company Ltd.	Snowdon Mouldings Ltd.
Supreme Plastics Ltd.	Tri-Wall Containers Ltd.
Ultimate Equipment Ltd.	The United Yeast Co. Ltd.
Whitworth's Holdings Ltd.	William Grant & Sons Ltd.

Our thanks go also to the Royal Geographical Society, and finally to the Cambridge University Explorers and Travellers Club from whom the initial impetus was received.

\* \* \* \* \*

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