

FOR THE ROYAL JUBILEE —

A RETURN TO THE ROOF OF THE WORLD

AND THE STORY OF



THE 1977 NORTH OF ENGLAND HIMALAYAN EXPEDITION

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Paul Bean. Expedition leader and photographer. (30). Draughtsman. Led expeditions in 1975 to Hindu Kush mountains of Afghanistan and East Kulu Himalayas. 12 years climbing experience in Britain and European Alps.

Dawn Bean. Food officer and camp management. Part time teacher. Hindu Kush in 1975. 11 years climbing experience in Britain.

Tara Chand. Assistant food officer and porter liaison (39). Magistrate, Kulu Valley. Assisted many expeditions to Kulu Valley. A hunter with natural mountaineering ability.

Rowland Perriment. (25). Horticulturalist. 1976 Bristol University East Kulu expedition. 6 years climbing in Britain and European Alps.







Barry Needle. Medical and survey (34). Draughtsman. 1974 Turkish Cilo Dag expedition. 16 years climbing in Britain and European Alps.

George Crawford-Smith. Survey and meteorology, finance officer. (32). Shop proprietor. Climbing in Britain, Sweden and North America. Scientific research White Mountain, California.

Steve Berry (28). Estate Agent. 10 years climbing in Britain and European Alps. Invited to join the expedition after his own Kulu expedition had been abandoned.

Foreword

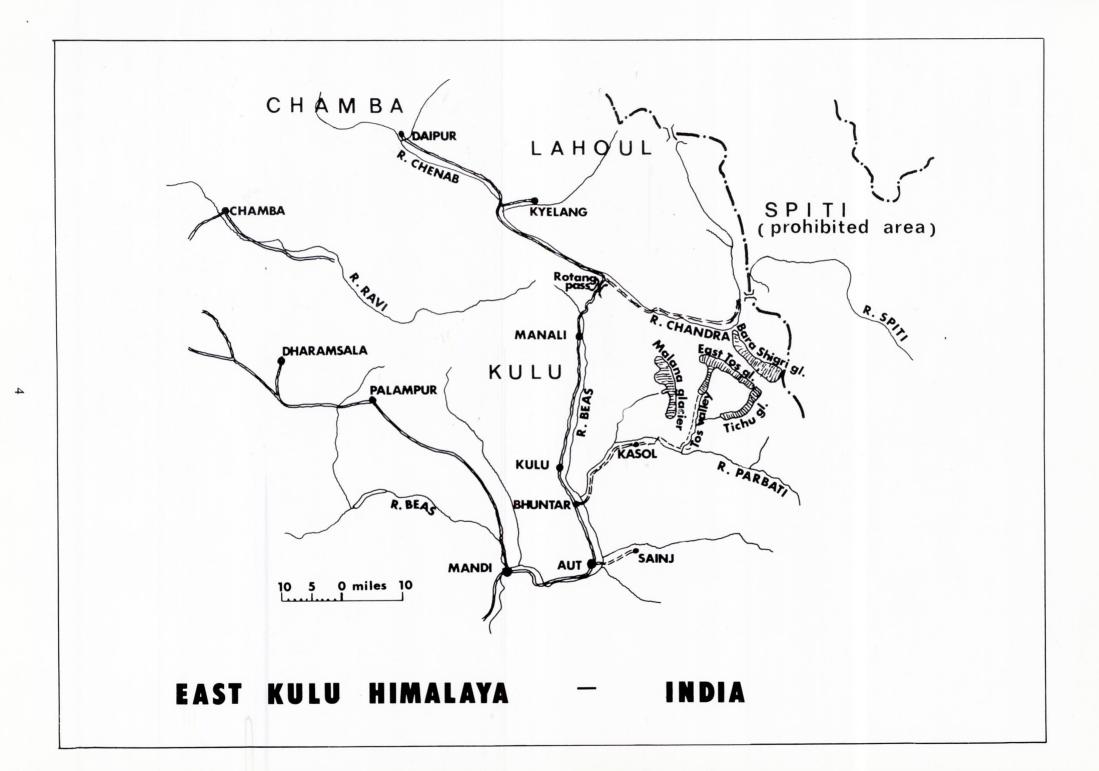
In writing this report I have decided to rely largely on extracts from team members diaries and accounts written at the time, as in this way I feel a more accurate picture can be formed of the atmosphere throughout each stage of the expedition. However, the introduction of our two originally proposed objectives was written prior to the expedition, based mainly on photographs. Although such expected problems as the Papsura glacier and the "meringue" proved easier than anticipated, the introduction has been left because these were problems we were prepared to meet, and as a comparison for the readers interest when he reads how the expected difficulties are unexpectedly overcome.

During the section covering the superb and very difficult route on Papsura I have mixed Barry Needles account of the climb with observations made at the time with the aid of binoculars from advance base camp. At such a distance it's natural that some of the observers assumptions should prove incorrect, but again it illustrates the tense atmosphere prevailing at advance base during the climb.

The successful ascent of Papsura by the South West ridge added a tremendous bonus to an expedition that had already achieved its objectives, having done so one week ahead of schedule by making all possible use of a very brief spell of PREDICTABLE weather but most of all having retained an excellent level of humour and compatability within the team. Personally it was a most pleasurable experience and I hope each member of the expedition found the rewards he justly deserved.

Cover photo — Approaching assault camp Devachen.

Paul Bean, Expedition Leader, Stockton, July 1977.



INTRODUCTION

(Pre-Expedition)

When leaving the East Kulu Himalayas of Northern India after the expedition in 1975, we were well aware that further and more ambitious challenges awaited those caring to follow. The challenge can take two forms, either an unclimbed peak or a new and perhaps more direct route to the summit of a previously climbed peak. The former can bring to the climber a tremendous feeling of adventure from slowly gaining height, aware that at any moment some unforseen obstacle might prevent success, to the final moment of standing where no man has stood before. The harder the climbing, the greater the reward, but often the first ascent of any high mountain is made by the easiest route and offering most chance of success as was the case in 1975.

Through the years, expeditions have slowly reduced the list of unclimbed peaks in the Himalayas and it's only in less visited areas that the climber can find a suitable objective. Even though our 1975 expedition reduced the number by five, and an expedition from Bristol in 1976 met with equal success, the East Kulu still has numerous unclimbed peaks. The highest had fallen and all but one of those left were under a height that would attract an expedition. The exception is Point 20,300. Known only by its surveyed height, this magnificent peak has caused much interest since it was first closely studied during a reconnaissance expedition in 1965 but it wasn't until 1976 that a serious attempt at reaching the summit was made. This was by two members of the Bristol expedition, who got to within 500ft. of the summit before a combination of circumstances forced a retreat. It was natural that Rowland Perriment, who was a member on that attempt, should be keen to return with us and from his observations we hope a more direct line of approach via the Papsura glacier, better snow conditions and a higher final camp will present us with the peaks first ascent and the chance to give such a gracious landmark a more befitting name.

At 21,148ft. White Sail or to give it its local name "Dharmsura" is the second highest peak in the area with ridges forming a connection with Papsura the highest at 21,165ft. and then Point 20,300. They rise steeply from the heavily crevassed Papsura glacier to present a beautiful and impressive Himalyan Trilogy.

Both White Sail and Papsura have been climbed previously, the first ascents in each case going to British expeditions and both peaks now offer the second type of challenge, that of a new and more difficult direct route to the summit. In choosing to attempt the huge South West ridge of White Sail as our second objective we might forego the rewards of inching towards an unclimbed summit, but we fully expect the problems involved in avoiding the known hazards, plus the higher degree of difficulty particularly one section of seracs or ice walls just below the summit (meringue) to more than compensate. In the case of both Point 20,300 and White Sail the odds against success are just nicely balanced.

(Pre-expedition report Middlesbrough Evening Gazette, December 1977).

Apart from the "meringue" and an ice fall that had to be overcome or avoided before gaining the Papsura Glacier, what worried us most was the glacier itself. In order to reach White Sail and find a suitable site for advance base camp we would have to cross what photographs showed to be a very badly crevassed area and possibly threatened by avalanches from White Sail. In order to reach Point 20,300 the glacier would then have to be followed and again it seemed almost certain that we would have great difficulty in finding a way through. The expedition was prepared to take the risk of attempting to reach Point 20,300 via the Papsura Glacier as, if successful, it would provide a more direct final climb to the summit but we were aware that efforts would have to be quickly switched to the route attempted by the Bristol expedition if necessary.

APRIL 4 — MAY 3 The Kulu Valley and Final Preparations

The journey from Delhi to Manali in the Kulu Valley takes a day and a half and is made bearable by catching the so-called luxury bus. You get a seat and it's all yours; even the space immediately in front of your nose is no longer occupied by the steaming torso of a fellow traveller. Like all the buses, the windows are protected by steel bars and I have never been able to decide whether it's to keep people out or in. One other noticeable difference is that on a luxury bus the roof luggage rack is strictly luggage only.

A recent journey in Nepal on not such a luxury bus gave Rowland, Dawn and myself the opportunity of escaping onto the roof along with twenty five assorted Tibetans, Nepalese and a mountain of baggage, while down below seventy or more poor souls were wedged and twisted into every last inch of breathing space. The Nepalese holiday occupied the two months prior to the expedition and apart from allowing us the chance to explore the remote Langtang Himal it provided a very useful period in which to become more acclimatised to altitude ready for the expedition.

From the plains, the narrow bumpy road ascends and descends through low cultivated foothills until finally dropping to the River Beas and the mouth of the Kulu Valley. The road then disintegrates and being able to compare its condition with that of two years ago, I can only think that nature is winning. Long sections that tunnel through or cling rather uncertainly to the crumbling walls of the Beas Gorge do so seemingly more by good luck than good management and are only kept from excessively long closures by the constant efforts of Tibetan refugee road gangs.

The valley then broadens out as the road passes through vast apple orchards and pine forests. Shepherds moving their herds of goats and sheep towards the high summer pastures cause frequent delays until after passing through numerous small villages you finally reach Manali.

Manali could never be described as a very attractive town, but it functions under its own steady pace in supplying the scattered community while the mixture of Tibetans with people from the remote border states add colour and interest to the daily scene in and around the bazaar.

From Manali we walked up 700ft. to the village of Koshala to be met by Tara Chand. We quickly reduced his tidy room to an untidy dump of expedition equipment. In 1975 Tara gave us much valuable assistance as he has with most expeditions to the area and although his hunting has often taken him for long periods above the snow line he had never accompanied an expedition. So Tara was invited, but to allow him to leave his fields we first had to give him a helping hand. A pathetic struggle is more often what it turned out to prove, but there was always the bright hope that we were getting fitter and that living at 7,000ft. might help us later.

Rowland, Dawn and myself reached Koshala on April 15 partially to help Tara as well as stock pile and pack all the locally purchased food amounting to practically 99% of the expeditions total requirements. With the exception of dried soup, potato powder and dried mince a more than adequate menu can be obtained locally, thus saving the headaches in transporting it from Britain and the huge cost involved. Apart from attempting the two climbing objectives, we wanted to add further proof that at least in certain areas of the Himalayas it is possible to proceed with very little of the vast financial outlay and administrative burdens that were synonymous with Himalayan expeditions in the past. The 1976 Bristol expedition were delayed from reaching the site of their base camp by excessive snow in the Tos Valley. The mules had to turn back early which meant over a week was lost while the climbers ferried the loads the extra distance themselves. Although when we first arrived in the valley it was apparent that the area had seen a very mild winter, during our preparations to enter the mountains the weather had seriously deteriorated and each day the snow line crept a little lower.

As it now looked possible that the expedition might meet a similar problem in getting through deep snow to base we decided that Rowland and myself should set off eight days in advance of the main party, (arriving from England on May 10th) and with 80% of the expeditions food and equipment try and establish a temporary base camp at the site of our 1975 base.

As well as six mules we decided to take four porters in case we met similar conditions to the '76 Bristol expedition. It was a decision for which we were later to be thankful. One weeks delay then, would have meant attempting the final stage of the climbs in the terrible period of weather which we met during our descent. The expedition would have been a disaster. The other advantage in setting off in advance was that hopefully by the time the main party with their limited amount of time arrived, most, if not all of the slow period of load carrying would be over. So as to be in a higher position ready for good weather in which to start the attempts on the peaks, I intended to have only a temporary base at the site of our 1975 base and to establish this years base on the East Tos glacier at 14,000ft., below the Papsura icefall. Then, when conditions looked right to establish an advance base camp hopefully within two days of the summits. A low base might mean more comfort but it leaves further to go when the time for the final stage arrives and could mean the loss of being able to take advantage of a short period of good weather. This was another factor which later played a very significant part in our successful outcome but also emphasises the point that an expedition requires a great deal of good luck in its timing with the weather. It's all a matter of being in the right place at the right time.

MAY 4 — 12 The Approach March and Temporary Base Camp [12,000ft.]

The approach march is often thought of as one of the most relaxing and enjoyable stages in an expedition. Suddenly the big adventure has begun and any tension seems forgotten.

Rowland and myself started from Koshala on May 4th. During the night the snow level had crept to within 400ft. of the village and we walked down to Manali in a torrential downpour. We kept our thoughts to ourselves. Carrying the final loads down to the bus with us were Merr Chand and Hachum Ram, two of our four porters. The other two Kharam Chand and Likhat Ram caught us up later. Apparently they didn't think the Sahibs would be daft enough to set off in such terrible weather, but we had no choice as the mule man was meeting us near the roadhead at Kasol in the Parbati Valley.

The bus took us three hours down the Kulu Valley to Bhuntar where we had to transport the baggage across the narrow bridge to the remnants of the bus that was to take us up to Kasol. The road proved to be no better than we remembered it, and being wedged in with eighty others actually helped, but apart from the normal tortures the steep unsurfaced road had withstood the rain very well with only one landslide and one engine failure causing delays. During the evening the muleman arrived with his six mules. The four porters seemed in good spirits despite the obvious presence of deep fresh snow ahead and after a night in the tourist rest house, our well assorted but organised caravan set off on the first stage along the Parbati Valley. Through Manikaran with hot springs seeming to squirt steaming water from every orifice. Keeping high above the crashing waters of the Parbati we passed through the beautiful timber and slate village of Barsheni and camped at the mouth of the Tos Valley. Even the low peaks were plastered in fresh snow and stood out brilliantly against a threatening dark grey sky, the contents of which were soon being driven at us by a strong wind. The view up into the Tos Valley didn't look too encouraging.

On May 6th we climbed through Tos Village and up past some huts used as a camp in 1975 before finally camping in a lush open meadow later to be occupied by huge herds of goats. We'd gained half a days progress from our 1975 approach march but by 10.00 a.m. next morning the mules ground to a halt in 3ft. of melting snow. Out of the snow we could just see the roof of a stone shelter. It was the spot where in 1975 we made our last camp before reaching base camp half a day higher, but to attempt to get the mules any nearer was out of the question. The mules were sent down and we set up what was to be known as shelter camp and the advance parties base for five nights. During this time we struggled under 40lb. loads through deep snow and making four carries finally established temporary base camp on May 12. This stage of the expedition will clearly stand out in my mind as being mentally and physically the hardest. The first carry had taken over nine exhausting hours, the weather was getting worse and the thought of meeting technical difficulties 9,000ft. higher produced morbid humour and pessimistic suppositions. Merr Chand was sent down with the letter for the main party detailing late requirements. Hachum Ram was worn out and went with him leaving the other two to occupy temporary base with Rowland and I and begin preparations for establishing base camp at 14,000ft., below the Papsura ice fall. The snow continued to fall but by setting off at 4.00 a.m. we found firm snow providing much easier progress. The low temperatures outweighed by the saving of energy On our first night at temporary base I wrote in my diary "We reached temporary base under clear blue skies which made a pleasant change. The sun bounces off every surface trying to make exposed skin resemble that of a dried prune. We dug tents into the snow, carved out a suitable kitchen and declared temporary base as being established. Despite todays improve-ment in the weather I still have some misgivings in deciding to use the word temporary to describe our present base."

MAY 13 - 20 Base Camp [14,000ft.]

The improvement in the weather continued. At 4.30 a.m., May 13th, we set out on the first carry to a suitable site for base camp. My diary for the day — "The snow gave off a pleasant crump sound was we gained height very rapidly marking the route with flags at appropriate points. In 1975 the Tos glacier was a huge field of unstable glacial debris and now at last we could turn the late winter snows to our advantage. The early morning sky turned threatening, but added drama to our first clear view of White Sail. The ice fall looked even more dramatic and sent down an avalance of ice in a display of self destruction as we reached a site for the camp." The same evening it started to snow heavily and by the morning of May 14 not only was another carry to base out of the question but we had a continual struggle to prevent the tents from collapsing under the weight of the snow.

May 15th saw our second carry to base camp over an unreliable top crust above 2ft. of powder snow still with 40lb. loads. It was hard work but rewarded by a spectacular sun rise and all the peaks glistening against a deep blue sky.

Even the ice fall looked less forbidding or perhaps we had just become more accustomed to its presence. My diary for May 15th — "For the advance party to press on and establish base camp would produce a gap in levels of acclimatisation that could easily continue to widen and so prevent the full team from being physicaly prepared at the time of a summit attempt. So with base camp now within sight of being established and snow flattening yet again the three tents at temp base, we sit like final year students awaiting with interest the arrival of the New Boys."

The main party arrived on May 16 and after a full team carry the following day we moved up on the morning of May 19 and occupied base camp. The porters who had assisted the advance party now descended leaving the expedition in a position ready to establish and occupy an advance base above the ice fall on the Papsura glacier. Just after the tents had been pitched it started what was to prove our heaviest snow fall. Continuing all that afternoon and through the night, the tents had to be regularly dug out, it was a task to which I had become accustomed.

By now the remainder of the team were becoming a little more acclimatised, but the power of the sun was having its effects on the new pale faces even through a barrier of glacier cream and with a midday air temperature barely above freezing. Georges lips in particular went through considerable alteration and got him first prize in the expedition Gurney competition.

The next stage involved the finding of a route to above the ice fall and to achieve this we had observed a steep snow covered glacial moraine rock ridge to its right avoiding all risks from falling seracs (ice blocks) and only threatened from above by small powder avalanches. We then had to find a way across the top of the ice fall to a suitable site for an advance base at the foot of White Sail. We hoped the camp would be at about 17,000ft., but we expected to meet large crevasses possibly causing lengthy detours as well as difficult climbing and thereby dictating for us where the camp would be sited. The important thing was that it would provide a base within two days climb of Point 20,300 and White Sail.

We were about to face our first expected difficulties and dispite the terrible snow conditions which we knew were waiting for us higher up, there was a tremendous feeling of anticipation and enthusiasm.

MAY 21 — 24 Advance Base Camp [16,000ft.]

We decided to stock advance base with one weeks high rations as well as the camping and climbing equipment necessary, holding a further weeks food in reserve. The total loads would involve the equivalent of 15 man/day carries.

The first day's carry and reconnaissance started at 6.00 a.m. with a steep and exhausting climb up the ridge beside the ice fall and a look up the Papsura glacier for the first time. We couldn't believe our luck

Advance base camp (16,000) looking south towards Tara Par.

but it appeared that the excessive late snowfall had covered the majority of the small crevasses and that with luck the large ones could be avoided. While the others dumped their loads level with the top of the ice fall, Rowland, Tara and myself roped up and moved cautiously across the glacier. A long steep slope had us fighting for breath but our steady progress on a route that was proving relatively free from crevasses and avalanche danger kept us enthusiastic to press on. The snow was soft and powdery, making our trail look like a silver trench through the snow.

There was no wind and the sun tried hard to drain what little energy we had left. At 10.30 a.m. we descended a short slope and finally halted at the exact spot I had noted from a photograph as possibly providing an ideal site for advance base camp. The first expected problem had been overcome with a lot of effort, but little difficulty. Again the bad late winter was being turned to our advantage. From an account I wrote on May 21 -"Sitting in the snow at the base of White Sail and a suitably protected site for our advance base camp. We can now look out over the rim of the ice fall and the East Tos glacier towards the impressive mountain wall that overshadows base camp and which at present is providing a breathtaking spectacle (that is of what breath we have left), as the seracs, runnels and ridges of snow turn golden with the rising of the sun. To our right the Papsura glacier continues for over 3 miles as a twisted broken valley of ice towards Point 20,300 which we can now observe cearly for the first time. The final 3,000ft. appears as it does from most angles as a beautiful spiralling pyramid of snow and rock with the first half of the face we intend to climb providing an unbroken slope of snow at present reflecting the sun like a mirror. Or White Sail all that can be seen is first the snow ridge which leads to a huge verticle rock buttress forming a prominant shoulder and from the foot of the buttress running diagonally to the right what we originally expected to be a deep snow gully or couloir. From our present position we can now see that it is in fact steeper than expected and shallow, more like a ramp. Another even more alarming discovery is that the altimeter gives the height of the intended advance base camp site as 16,000ft. and not 17,000ft. as I had originally hoped, which means that the final stage will involve that much more effort. With predictable weather, better snow conditions and splitting into two groups attempting both peaks simultaneously, I feel we are now at least in with a chance. If only the weather would settle down. It's all part of Himalayan climbing but doesn't make it any easier to accept when the final stage is drawing near.

After dumping our loads and making some hurried observations we beat a hasty retreat down through rapidly deteriorating snow to base camp. It had been a very productive day.

When we got back we could see Barry and George out in the midday sun on the East Tos glacier setting out a base line for the expedition survey which was carried out as a revision to our 1975 map. Through the course of the expedition observations where made from various points resulting in a very comprehensive picture of the area. The revised map is as produced in the centre of this report and appendix E deals with the work involved and the problems encountered.

On May 23 at 4.30 a.m. base camp was partially dismantled and added to the last load to be carried up to advance base. Heavy loads soon had the parties spread out across the glacier, while the sun had sweat mixed with thick layers of barrier cream running down faces like wax off a candle. A kitchen was constructed from a tent flysheet and with the erection of a mountain tent and two hoop tents on a surface hopefully concealing no crevasses, we declared advance base complete. Apart from early morning a convenient trickle of melt water usually avoided the time consuming task of melting ice, and being free from avalanche danger we couldn't have wished for a better site.

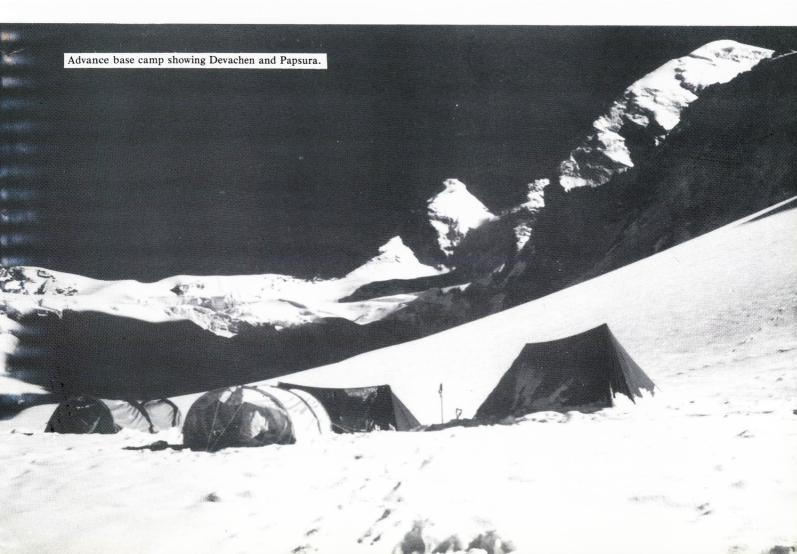
The view was tremendous and as we relaxed and tried to become accustomed to the rarified air, binoculars were trained on our two objectives while conversation centred on the respective problems of each. The mood was optimistic and at last the weather seemed to setting into a more predictable pattern with beautiful clear mornings, a snow fall around mid afternoon and then clearing again towards late evening. Despite the necessity for head torches and the penetrating cold it was obvious that we were going to need very early morning starts during the three day climbs in order to avoid moving in bad weather.

During dinner I put my proposed plan to the other members. It was based on performance during the last four days and from casual discussions with each individual on his preference. The other factor normally to be considered is temperament but it was one of the greatest pleasures on the expedition that this consideration was never necessary. Without adverse comment or suggested ammendment the plan was adopted. It was as follows:

"Tomorrow (May 24), Tara, Barry and Paul Bean carry out a reconnaissance of the approach up the Papsura glacier towards Point 20,300 while Rowland, Steve and George (unless wanting to continue his survey work) to climb to a suitable point to observe the ramp on White Sail and if possible the slopes above. May 25, both groups to leave advance base camp. Paul Bean, Tara Chand and Barry Needle to establish an assault camp as high as possible at the head of the Papsura glacier ready to attempt the first ascent of Point 20,300 on May 26. Meanwhile on May 25, Rowland, George and Steve to establish their assault camp above the ramp so as to continue next day (May 26) in attempting the first ascent of the South West ridge of White Sail."

May 24, after a cold night during which severe gusts of wind tore at the tents, George climbed up above camp and added to the rapidly developing survey. Rowland and Steve's first attempt to reach a rocky peak overlooking the East Tos glacier and providing an excellent view of White Sail failed due to unexpected difficulties and dangerous snow conditions but a second attempt by a different route and Rowland climbing solo proved successful. His observations were as valuable as those made by Tara, Barry and myself on the Papsura glacier. After only 1½ hours we were able to confirm the suitability of our route up to that point though we had expected it to be the most heavily crevassed. We also observed a continuing route towards a possible site for the assault camp.

Setting off from the advance base with flags in case of bad weather we crossed one particularly large semi open crevasse involving 150ft. of careful progress, but like the areas where we know crevasses are lying close under the surface we should be able to cope with the problems without much delay. Another cloudless day. What will tomorrow bring? Apart from food, tomorrow and the start of the first attempts occupies all conversation. I only hope each individual finds the rewards he deserves."



MAY 25 - 26

The First Ascent of Devachen [Point 20,300]

In Buddhist mythology, Lama Dzi-Chen Rimpoche advised two demons who it is told had been eating 500 people a day, that if they repented then he would lead them to "Devachen", the paradise of boundless light. Whether we would find ourselves climbing through

Whether we would find ourselves climbing through boundless light or grey icy cloud the name had a pleasant implication and so with no more ceremony other than a full agreement, Point 20,300 became Devachen. The following account of the first successful ascent of the peak is extracted from notes scribbled during the climb mixed into a full account written up upon return to advance base.

May 25, 3.30 a.m. The crunching of boots on snow indicates there's life in this frozen planet. George, Steve and Rowland fumble with numbed fingers as they prepare to set off on their attempt on White Sail. Flasks filled the previous evening save a lot of suffering by making breakfast quicker to throw together, but the hoop tents need de-icing before they can be packed and undoing the joints on the thin fibreglass poles proves painful at such times. By 5.00 a.m. they are ready to set off. They need an early start in order to finish the ramp before the sun turns the steep slope into a dangerous condition and melts free rocks above causing a fusillade that would be difficult to accept. It's the bulk of White Sail that keeps the sun from reaching the Papsura glacier and so keeps us in the warmth of our sleeping bags for another hour.

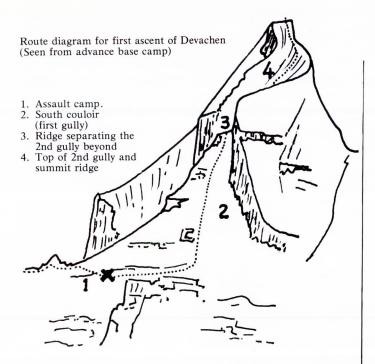
6.45 a.m. Roped up and ready to set off. Dawn wishes us good luck and remains as the sole occupant of advance base. As a relay between the two climbing parties in the event of an accident, signaled by distress flare, Dawn's occupation of advance base is an important role and her absence from either of the first summit attempts is accepted without too much disappointment. Slowly we make our way onto the glacier avoiding obvious problems until after only one hour we reach the large crevass. It's so wide that we have to descend into it and cross over on snow that has formed a sunken bridge. The crevasse proves to be a kind of moat for once across it we find ourselves on a flat and open crevasse-free central section of the glacier. Surface cracks run in all directions, indicating the presence of hidden depths but for now progress is easy. The sun appears and puts a beautiful glitter to the fine particles of powder snow. It also catches the huge buttress like South West ridge of Papsura. What a superb route it would make. We stop to rest and study closely the possibilities. It might be feasible but undoubtedly very difficult.

We have now been going three hours and straight ahead of us rises Devachen, but direct access is barred by an ice fall and the shortest way past on the right is threatened by avalanches from Papsuras West face. We decide to climb straight up onto the ridge that forms the end of the glacier and is infact part of the very long south west ridge of Devachen itself.

The steep climb is killing and once on the ridge at 11.00 a.m. the sun seems more determined than ever to destroy us. With heavy sacs and 12" of soft top surface each step takes a determined effort, but at least now we've gained most of the height to our intended assault camp and the view over towards the mountainous border districts of Lahaul and Spitti with Tibet beyond, is a fascinating sight.

The ridge proves longer than expected. Soft wet snow on rock makes the last hour awkward in our weary state and to think that the big effort will be needed tomorrow doesn't help. Finally down a very steep snow slope of 200ft. to our right I can see the crevasse and its protected bottom edge that will provide a suitable site for the assault camp. We reach





it at 4.30 p.m. It's been a long, hot exhausting day with Barry in particular feelings its effects.

Diary 7.00 p.m. "The sun has been set behind our ridge since 4.30 p.m. It's bitterly cold, dinner of mince and mash turned cold the moment it came off the cooker and now inky black thunder clouds are moving rapidly towards us. 8.00 p.m. Looking at a pre-arranged time towards White Sail and the shoulder on which at 11.00 a.m. we had noticed tiny black dots pitching camp, watching in case a flare indicates trouble requiring the full expeditions assistance. After all this effort and being so close to the summit it would be more than disappointing, but no flare appears and I'm able to wedge myself back into the tent." (Unknown to us was the fact that although it was a situation from which they could extricate themselves all was not well on White Sail and next morning their attempt was turned into a retreat). May 26. Davachen assault camp (18,500ft.) 5.00 a.m. The moon strains through a vapoury sky, no stars and to our south lightning flashes almost continuously, large anvil shaped thunder clouds that have moved backwards and forwards all night now appear to be creeping forward again. It's decided to continue with the attempt whilst keeping a very watchful eye on the progress of the storm. To be frozen one minute and fried both sides the next isn't acceptable.

5.45 a.m. We leave the tent and traverse below the ridge along the edge of the crevasse and into the foot of a wide snow gully which is to form a large section of the route to the summit. Visible from advance base the slope looks wide and inviting, but now at 6.15 on a grey, icy morning and with the very strong possibility of the storm ending our attempt, the slope feels steep, narrow and inhospitable. The ice is covered with a thick layer of powder snow that hasn't compressed and gives little or no strength to each foot step. The storm also seems hesitant whether to go on or turn back. To increase our speed we climb together instead of rope length at a time. It's exhausting but the weather has produced a strong sense of urgency. The top of the gully looks very near, but the slope is deceptive and it's only after 1,200ft. of soft steep snow that I am finally able to take the lead and secure our first solid belay at the top.

We are now near the point where Rowland turned back in 1976. The top of the gully is formed by a narrow ridge and beyond it at an angle of 50° to 55° lies another steeper gully that drops alarmingly from where I stand down 2,000ft. to a snowfield below, but the continuation of the ridge however looks even more intimidating and certainly more time consuming. For the next 450ft. Barry and I take alternate leads up the steep gully, all too aware of the unstable snow conditions and taking care in fixing protection on whatever rock is available. Now in the gully the exposure is felt and the thought of the descent is pushed to the backs of our minds.





Tara on the summit of Devachen looking towards Indrasan.

The clouds roll away and as I reach the summit ridge at 11.45 a.m. the sun puts extra encouragement into me. The previous days climb to the site of the assault camp, the mental uncertainty of whether to ignore the approaching storm, the bad snow conditions and then finally the altitude have left me more shattered than I can ever remember. Barry is worse, but somehow keeps going. His first expedition to the Himalayas and his big day. All that shows on his face is agony.

'After reaching the summit ridge a temporary return of strength allows me to increase the pace and so greatly impress our audience who have now picked up our progress through binoculars from advance base (I didn't know of course that the audience included the disappointed White Sail team who had just returned). My strength runs out at a final steep section just below the summit. I sink onto my knees and suck at the snow for moisture. Tara takes the lead. Rock hard water ice under soft snow, the consistancy of porridge. Crampons clog up becoming useless weights attached to aching legs.

Tara stops, 30ft. above him the snow meets a deep blue sky. We move up till there's no more up to go. There's nothing beyond but space and a sea of mountains. It's 1.30 p.m., my feelings are emotions mixed with pain. "Barry it's great to see you here". Hands are warmly shaken. From Barry's diary — "I felt no elation just absolute and utter fatigue". Not much more is spoken, each tries to recover ready for the descent. Clouds move in as photographs are quickly taken and Barry tries to get as many bearings for the survey as possible. One of our orange marker flags is wedged into some rocks and as the thunder storm moves in again we take a final look at the World stretched out before us and set carefully off in descent. The one hour on the summit has gone too quickly, barely allowing time to recover, but it's late and even without being caught in a storm the steep descent won't be easy. What a day! Perhaps later I'll be able to remember some of the good times and less of the bad, photographs are good for doing just that, but no success is worth reliving unless it was achieved with difficulty.

Looking back on the descent I can feel pleased as much as I was relieved at the time, that we were able to execute it quickly, for no sooner had we reached our assault camp than it started snowing heavily. It was expected that we would rest there and continue the descent next morning, but the fear of having to break a fresh trail through deep snow made us ignore our weariness and the fact that it was 5.30. While Tara made a welcome brew Barry and I quickly stuffed the tent and equipment into rucksacs and by 6.00 p.m. we were ploughing down through the fresh snow on a fast descent. Hidden reserves and the setting sun forced the pace and after only two hours we were crossing the large crevasse and drawing the attention of the camp dwellers. The low sun shining through gilt edged gaps in the clouds provided a beautiful setting as we moved amongst the last crevasses and plodded wearily into camp just after 8.00 p.m. Our success was enjoyed by everyone. Such is the pleasure of having an expedition whose members find rewards in others achievements, but in turn we were made aware of the bitter disappointment felt by the members on the White Sail attempt, the outcome of which we now heard for the first time.

From Steve's own account, "May 24, advance base. George, Rowland and I are up by 3.30 a.m. and with night fading we plod, plod, plod up the snow slopes to the foot of the couloir/ramp. It's hard work but I'm going well. However, half way up I start to feel weak and dizzy. We rope up and with protection on the



Assault camp for 1st attempt on White Sail with South face of Papsura in the background.



rock move together slowly. The angle is quite steep especially near the top, around 55° and the last rope lengths involved nasty power snow prone to collapsing. It's exciting, even for me feeling washed out. Rowland hacks his way through a cornise at the top of the ramp and when it's my turn to follow I get quiet a shock. A flat snow plateau 30 yards wide, with Papsura as a backdrop, so close I felt I could reach out and touch it. By now I was in a state of virtual collapse and the sun had taken over from the steep slopes of the ramp as agressor. The next 200ft. to our intended site for the assault camp took me nearly an hour and delirium not far off. Later we'll be in our tent boiling, holding insane semi conversations. George is groaning with a splitting headache, while Rowland cooks supper. After taking two sleeping tablets that put me out for barely one hour, I began one of the worst nights in my life. Freezing cold, gasping for air with every breath, no sleep. In the morning the decision to go on or retreat is mine. Wanting to finish the climb so much, knowing that if I go down the others will have to come too, having been invited on the expedition because my own partner had taken ill in Manali and returned to England. I would be letting everyone down. But it was no use, my illness prevailed and we descended. From a personal point of view I confess I have rarely felt more depressed. Climbing in the Himalayas had been a lifelong ambition, my own expedition had ended with two unsuccessful attempts and now this.'

We got back from Devachen to find Steve feeling particularly low but Rowland and George were determined to try again and were already bedding down ready for attempt number two, next morning.

May 27th, advance base, from my diary, "George and Rowland set off for White Sail early this morning. Dubious weather and almost immediately vanished into thick cloud. Barry and I spent the day in a state of collapse and Tara joined the sick bay with chronic toothache. 3.30 p.m., a threatening snow storm, apprenhensive, perhaps they've managed to climb above the cloud, but it's not looking very hopeful. Barry has recovered enough to join Steve in going down to base camp and returning tomorrow with more food. 6.00 p.m., a clearing sky. It must be a relief to the two somewhere on White Sail."

May 28th, advance base, a terrible night, little sleep, woke up at 4.00 a.m. to find it snowing and the camp in thick mist, little hope of success on White Sail. 9.15 a.m., the sun puts a silver sheen to the top of the icy ramp as I watch through binoculars for signs of retreating climbers. Cloud returns and I'm left wondering. Will they have enough strengh for a third attempt, can Barry and myself recover in time, will food last out the bad weather? 9.55 a.m., through a break in the cloud a figure appears on the top of the ramp. More cloud. 10.05 a.m., another glimpse of the ramp and both climbers can be seen slowly descending rope length at a time. A tremendous relief to put it mildly, but what terrible disappointment they must feel". At 11.15 a.m. with snow falling, George shouted ahead for a brew. I asked out of politeness what happened and got the reply, "Got to the top and then couldn't see a bloody thing". I couldn't believe it and for hours the camp was lifted out of the gloom as we heard of their achievement.

MAY 27 — 28 The First Ascent of the South West Ridge of White Sail [21,148]

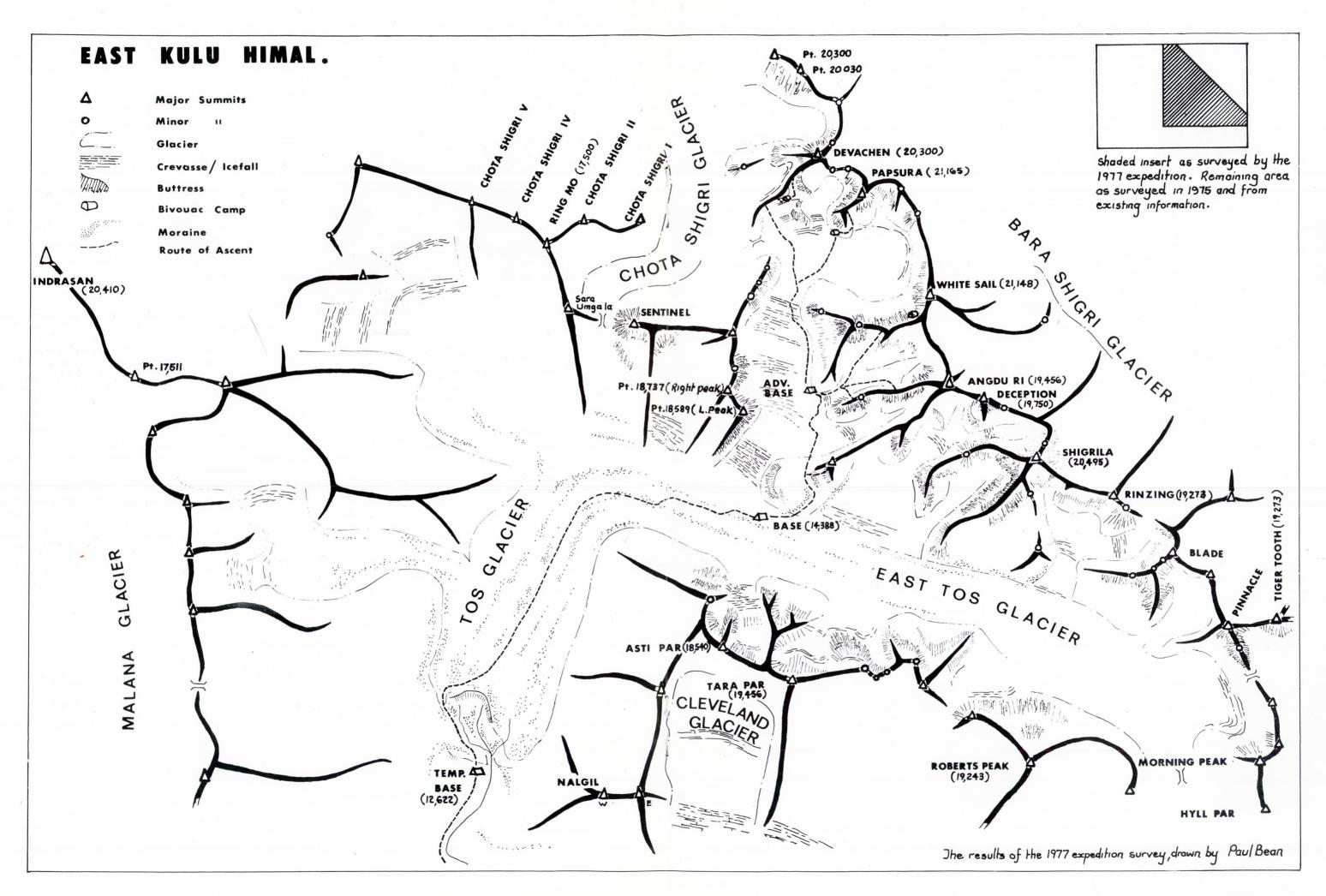
(The following is taken from an account written by Rowland Perriment the day after they returned to advance base).

'It's 3.30 a.m., May 27. Slight stirrings from within the ice encrusted tent. All too soon it's 4.00 a.m. and I'm giving George a shake as I emerge into the pre-dawn freezing temperatures. The primus is coaxed into life with rapidly numbing fingers. Icicles provide our only water supply and breakfast of tea and porridge seems to take hours. Slowly and somewhat reluctantly we shoulder our packs and set off towards the ramp just as the first light of dawn makes the surrounding peaks discernable. The weather is not good, perhaps we could use it as a suitable excuse to return and crawl back into the warmth of our sleeping bags. An hour later over 1,000ft. higher we stop to rest below an overhang. Cold fingers fumble with crampon straps. Above the rock the slope steepens and crampons have to bite into a hard, icy surface. We look about periodicaly keeping an eye on the weather. For the past two hours we've been climbing in cloud, but now suddenly we emerge above it into a completely different world. The grey, cold, unfriendly cloud gives way to a view of brilliant snow capped mountains floating on a sea of cotton wool.

White Sail. Route for first ascent of S.W. ridge. (See photo on page 26). 1. Advance base camp 2. Coulior 3. Meringue 4. Assault bivouac camp 3. Coulion 4. Assault bivouac camp 4. Coulion 5. Coulion 7. Coulion 7.

"8.30 a.m. over 2,500ft. above advance base and just completing the steepest part of the snowfield above the ramp. The sun brings warmth to our feet but makes us aware that above us the snow conditions will be rapidly deteriorating. In spite of this we steal a few minutes for a snack before now continuing up a narrow ridge.

"10.00 a.m. The air is getting noticeably thinner and the snow softer. Each step is taking more effort and the cloud layer has moved up to envelop us. The mountains take on a more sinister atmosphere. Still we plod on with gaps between rests decreasing and instead of ice axes used for support, a rest is usually an uncontrolled collapse into the snow. At the end of each 150ft. pitch, I fold up into the snow and look back through the swirling cloud as the ghostly figure of a shattered climber materialises at the other end of the rope.



"11.30 a.m. We've been struggling up the ridge, unable to see where we are aiming, or what difficulties be ahead. We need to find a place to pitch the tent.

"12.00 noon. Through a break in the cloud we can see not far above us the bulging seracs, known as the meringue and expected to cause the main problems. We've waited a long time to get a close look at it.

"The meringue proves much easier than expected and without too much difficulty we find a way up on the left. Heaving over the last steep section, we finally arrive on more level ground and find a suitable site on which to errect the tent. After this is achieved and having got hot liquid down our rasping throats, I pass into a distant dream.

"4.00 p.m. A meal, more liquid, always more liquid and all to be produced laboriously from melting snow. The cloud begins to disperse and it's not long before we can see our objective. The snowy summit no more than 1,000ft. above us looks quite close. We've done well and from 19,400ft. the view is stupendous.

"The long cold night wears on and we catch only odd spells of sleep until 5.00 a.m. To my horror I awake to the sound of snow falling on the tent and outside find the cloud and snow blending together so that nothing has shape or form. Could we have come so far to be stopped again? The worry is not the discomfort, but the possibility of walking over the edge of the mountain. A few minutes of indecision and then a commitment to try for the summit.

"It's like a game of blind mans buff, picking our way along the ridge to the summit slopes. Powdery snow makes for slow laborious progress. The cold is intense. Momentarily the cloud disperses and in a flash of sunlight we see the summit silhouetted against the sky and not far away.

"7.00 a.m. The cloud closes solidly in around us as we drag ourselves onto the summit of White Sail. No fantastic summit views, just photographs of misty backgrounds."

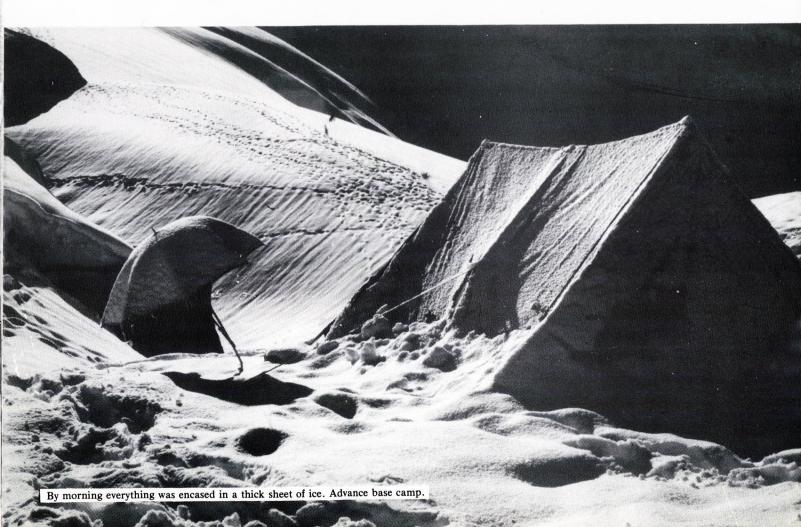
MAY 29 — JUNE 3 Papsura — The Grand Finale

From the time the successful White Sail team reached advance base to the early hours of the 29th, snow continued to fall almost burying us in the process. On top of the weather the 28th had been an anxious day with no sign of Barry or Steve returning from base. From being relieved that George and Rowland weren't stuck high up on White Sail to thinking that below us some other incident might have taken place. By 11.00 a.m. on the 29th we were certain that something had gone wrong and Tara and myself prepared to descent to find out what. Everyone kept to their own thoughts, but there was still a depressing atmosphere which vanished as they appeared floundering up through knee deep snow just 10 minutes later.

By rights the expedition could now sit back on its narrowly won laurels and enjoy a brief rest in the isolated, but magnificent surroundings of advance base before descending to the Kulu Valley, but we still had one weeks high rations left. With some anticipation it was decided that if more reliable weather returned we would attempt the very bold new route to the summit of the areas highest peak, Papsura (21,168ft.) via the south west ridge.

Robert Pettigrew, leader of the expedition which made the first and so far only ascent of the peak in 1967 recently drew my attention to the possibility of the route and a photograph taken by him during his expedition certainly showed it to be a very obvious, but intimidating aspect of the mountain.

After frequent opportunities to study the ridge we could treat it in a more realistic light, but it still looked far from easy. I wrote in my diary "The difficulties will be sustained over 4,500ft. of very steep snow covered rock by climbing the steep snow at the





edge of the South face. From a prominent shoulder the route would then follow the crest of the ridge with numerous verticle sections, but gradually falling back and finishing in a superb snow ridge to the summit. Even by alpine standards the route would be regarded as a serious undertaking, but Rowland and Barry are keen to make at least an attempt and will start as soon as predictable weather returns."

On May 30, while Rowland and Barry found a way of reaching the South face of Papsura across a rapidly opening glacier, Tara, Steve, Dawn and myself managed to squeeze in the first ascent of 18,000ft. peak just above advance base. The climb though very short, involved steep unstable snow producing some awkward sections and a superb knife edge ridge of snow which we used in descent, thus completing a traverse. Not exactly a major Himalayan conquest, but a very pleasant climb nevertheless.

The weather stayed very changeable. That night it was sleet, not snow that fell and by morning everything outside the tents was encased in a thick sheet of ice. That same morning (May 31) George and Steve set off to attempt a new route on Angdu Ri (19,500), a peak which was first climbed by our expedition in 1975. George was hoping the ascent would offer a further chance to add to the survey and Steve was out to get over his disappointments on White Sail. They moved quickly and camped close enough to the summit, not only to allow George to take an evening walk to the top during a brief clear spell and carry out observations, but to return again early next morning and complete them.

Meanwhile climbing equipment pruned down to a minimum for lightness had been carefully sorted out for the attempt on Papsura. The weather still wasn't perfect, but as food was rapidly running low it was decided that they would set off towards a camp at the foot of the face in the evening (May 31) ready to start climbing early next morning. Tara and I agreed to keep a continual watch on their progress and give any support possible in the event of a retreat in bad weather.

That afternoon I wrote "Rowland and Barry rest after being plied with liquid all day. With difficulty we could stretch the food left over four days. Even a fast success on Papsura will take 2 to 3 days, which means they'll have to put everything into just one attempt.

"5.00 p.m. For a moment the sun finds its way through. Rowland and Barry receive out best wishes for luck and success, but my worries and doubts I keep to myself.

keep to myself. "5.10 p.m. The first attempt on Papsuras S.W. ridge leaves advance base. The clouds continue to disperse. Devachen looks beautiful. To the south the cloud lies below us like a choking gas with peaks thrusting their heads through as if for air. It is indeed a beautiful if rather suspect evening.

6.15 p.m. Cloud rolls in again as I climb into the warmth of my sleeping bag. For the two on Papsura tomorrow must bring good weather. I lie awake thinking of their problems and chances. I suspect we all are."

Throughout the next two days a continual observation was kept of the climbers progress on Papsura through powerful binoculars, but often we were left in doubt of the true situation on the mountain. The story continues with a piecing together of observations written at the time with an account of the situation on the climb at that stage written by Barry upon his return to advance base. "Wednesday, June 1, advance base, 6.30 p.m. The day has been full of excitement and anticipation as first from a ridge on White Sail, Tara and I watched them steadily make they way up the South face gaining the South West Ridge at a prominent shoulder. Then they vanished beyond the crest for what seemed like ages before appearing again only 400ft. higher, unseen difficulties? Rowland then led pitch after pitch up steep slabs bringing an optimistic atmosphere to advance base until at 6.30 p.m. when having overcome what appears to be most of the difficulties, thick cloud rolls in. All I can think is that if their exhausted state will allow it they must feel incredibly pleased with their days progress. Our last clear view showed them already above an area originally throught of as providing a level platform for the hoop tent and within 300ft. of the 1,000ft. long summit snow ridge."

Barry's account of the climb to that point, "By 06.30, Rowland and I were soloing up an 800ft. gully to find a way through a rock band onto a steep snowfield and then to the prominent shoulder. The only thing of note at this stage was a slip by me causing rapid breaking with ice axe, but a loss of only 20ft. Rowland out in front remained blissfully unaware of the drama. I carried on panting that little bit harder.

"Finding a break in the rock band at its narrowest point, we roped up and Rowland led off. Alternate leads up steep connecting snowfields, landed us on the shoulder. The section up the South face had taken 3 hours. After a rest and a dive into the "goodie" bag we started up the ridge, being forced onto the left (North West) side of the crest immediately and trying for 300ft. of very difficult climbing to force back right onto the crest again and into the warmth of the sun.

"Once back on the crest, the ridge appeared as a steep tower which when climbed only fell back to reveal another tower and then another. The rock was sound granite, warm to the touch with occasional patches of snow, but giving very delicate climbing on short walls and steep slabs, all proving harder than expected. In rock climbing terms the grade would be V.S. (very severe).

"Rowland had done most of the leading, occasionally having to remove his sack for the hardest pitches and then having to haul it up on the rope. It's late in the afternoon, no possible place to pitch the hoop tent. A particularly hard pitch and I'm asking for a tight rope from Rowland above. We've no spare time to hang about or worry about ethics. Then another very delicate pitch this time right on the crest of the ridge and terribly exposed. We then climbed over a rock tooth and passed the area where we had thought we might be able to pitch the tent on a platform of snow, but on inspection it's too steep and most impracticle. Then what we feared most, ahead of us what looked like an impasse.

'The thought of retreat had been forgotten since we overcame the first hard pitch, early that morning and now the sight of the route ahead put a lump in my throat. Rowland launched off on a delicate tension traverse across a blank wall to the right into a steep snow filled corner and inched his way very carefully up rock thinly coated with unstable snow. We'd gained 60ft. in two hours and the route ahead still didn't look any easier. At the top of the corner a narrow snow and ice filled chimney led out right to a platform. Rowland cursed and strained his way up, sack wedging in the chimney and feet flailing about sending down showers of snow and ice. Darkness was approaching and still no place to even bivouac, let alone pitch a tent. I throw myself across the tension traverse and struggle up to Rowland with a definite sense of urgency. The climbing is proving desperately hard. As I lay gasping at the top in fading light I notice above and to the right a suitable ledge beneath a large overhang on which to spend the night. I was exhausted.'



Meanwhile, back at advance base camp, I wrote in my diary, "With George and Steve now safely back from Angdu Ri, the expedition sits out its last days at advance base in the pregnant atmosphere of a grand finale. 8.00 p.m., snow stopped, cloud thinning, no sign of distress flare. Next check 6.00 a.m. tomorrow. All looks cold and quiet on Papsura. 8.15, a red flash from Papsura — my heart misses a beat, then another flash followed by several quick flashes. It can't be a flare and my nerves calm down as I become aware of what I'm witnessing. At about 20,000ft. on the S. W. ridge of Papsura, dinner is being cooked or attempted atleast.

"June 2, advance base, 5.45 a.m. Perfect clear skies, through binoculars a small red dot shows the location of the bivvi. 6.00 a.m., no flare, but no sign of life either." From the tent we could clearly observe the remainder of the route. First 300ft. of steep rock and snow then 1,000ft. of continuous snow to the summit. Apart from fatigue and storm they faced only one possible obstacle. At about 20,500ft. we could see a verticle wall of ice with a crevasse immediately below it. The feature is known as bergschrund and is caused by the bottom part of a steep slope sliding away from the slope above. It was hoped that a way past could be found out of sight on the North West face.

Again from my diary, "7.00 a.m. The sun brings warmth to advance base, but the climbers in their tent remain in icy shadow. The temperature up there this morning can only be guessed at. No wonder they wait for the sun."

Barry describes the bivouac, "Upon reaching it the ledge proved to be just a level area about 3ft. wide. Too small for the tent, but it would have to do. Knocking several pitons into the rock to secure us and our equipment, we pulled on our sleeping bags and sat down on what insulation we could find. I lit the stove, it went out, I tried again, it was too cold and the paraffin wouldn't vapourise. I remembered thinking what the others at advance base would make of all the flashes as the stove refused to function properly. After one hour I handed Rowland a cup of melted snow with sugar and milk in, it went down without comment.

"Considering the circumstances we spent a surprisingly good night. Rowland sat on the ledge in his sleeping bag, his feet in his rucksak, hanging over the edge. I managed to stretch out luxuriously in the process of which I knocked the bag of milk over the edge into the darkness. The dawn, clear and brilliant put heart into us for what we expected to be the final day."

The story is taken up again from advance base camp, "8.10 a.m. life returns to Papsura as the climbers can be seen packing and sorting out equipment. 8.30 a.m., our hearts sink, it looks like they are retreating. Everyone grabs for the binoculars. The climbers descent stops and they can be seen traversing left onto the ridge and then moving up, definitely up. 9.45 a.m. The leading climber has spent one hour in gaining 100ft. either they are physically shattered or the ground is steeper than it looks, or both. 10.45 a.m. Rowland traverses across the last snow covered rocks and starts the long summit ridge. Their progress appears desperately slow, but the tension is lifting. Just over 1,000ft. to go. They disappear onto the N.W. face. 12.20 p.m. It's fantastic, first one climber then the other re-appears above the bergschrund, now nothing can stop them. Cameras with telephoto lense are rixed to makeshift tripods in anticipation of recording the final moment, but it's difficult to pick them out against the deep blue sky.

1.05 p.m., advance base erupts. The climbers gain the summit of Papsura, it's all over, bar the descent and the entire expedition share just a small part of the pleasure and intense satisfaction." For the two climbers who had just put behind them some of the most serious climbing of their lives it was a moment they'll never forget.

Barry describes the final hours leading up to reaching the summit, "I led off from the bivouac ledge. A stiff pitch taking over an hour, but I knew the snow ridge and faster ground to be not far away. Two more pitches on snow covered rock and at last we gained the continuous snow leading to the summit. The next obstacle was the bergschrund which when reached was easily passed on the left, only the summit ridge lay ahead. Narrow, steep at first, never ending. Just after 1.00 p.m. Rowland stepped on the surprisingly flat summit. I followed still too out of breath to say anything. We shook hands and shared a tin of sardines whilst sucking snow to shake off a burning thirst. So much for the sweet taste of victory."

Advance base camp, June 2. "2.25 p.m., shortly after the climbers could be seen leaving the summit a thunder storm moves in towards camp. Cloud hides Papsura. Snow falling. The weather is breaking rapidly."

All through the afternoon of June 2, the snow fell heavily causing considerable worry and the hope that the climbers got away from the summit and low enough before having to camp. As it grew dark Tara and myself returned from having made a search around the centre of the glacier just in case they had completed the descent, but snow driven by a strong wind wiped out all visibility and even our own fresh trail from the camp. In fading light and under the layer of fresh snow the crevasses looked strange and ghostly. The glacier felt weird.

On June 3, at 7.00 a.m., George, Steve and myself set out from advance base to break a trail and expecting to find them descending towards us across the glacier. After crossing the familiar large crevasse, we gazed up at Papsuras southern gully, used on the peaks first ascent in 1967 and over the glacier. No sign could be seen of the climbers or of any tracks. As it was possible that they had decided to descend down the untried North West ridge due to having had a close look at it while on Devachen, we set off up the glacier to take a look, leaving George to keep a check on the south gully. In view of the weather during the previous afternoon and the emptiness of the expected descent route we were indescribably relieved when they appeared descending the glacier from the direction of the North West ridge.

We altered course and met at the large crevasse. Warm congratulations but of our worries and doubts I didn't think there was any need to mention.

Due to the shortage of food and fuel, Dawn, Steve, Tara and George descended to base. After filling Barry and Rowland with their first hot meal in 3 days, I slowly receive the details of the climb itself, but particularly slow in coming were the details of the descent from over 21,000ft. down an unknown route and in a snow storm.

Barry's account finished with the epic descent to advance base, "The usual afternoon storm was approaching and looking particularly mean. A brief glance at the peaks around us, a few photographs. It was a common decision that we didn't want to try and descend the way we had just come, so instead I persuaded Rowland that we should start down the North West ridge connecting Devachan and then from near a col, down left onto the Papsura glacier. Paul and I had observed the route during the ascent of Devachen and although previously untried it did seem to offer the fastest route down. After a couple of rope lengths down, it started to snow. We moved on unperturbed down the ridge towards a snowfield about 500ft. below. It looked flat enough to pitch a tent and sit out the storm.

4.00 p.m. The snowfield proves too steep. Driving snow greatly reduces visibility. Rowlands beard and balaclava helmet are matted with ice, I must appear the same. My gloves are soaked and beginning to freeze up. After changing them for a dry pair, severe pains shoot through my hands as the circulation returns. Nothing for it but to keep descending. Down past rocks contouring the lower edge of the snowfield acutely aware of the drop on our left. The snow falls more heavily and Rowland hits ice. With numb fingers we put crampons on. The slope proves as hard and smooth as a mirror. Below there's a break in the steep cliffs to our left. Shelter? 6.00 p.m., Rowland slithers down to where I stand. No shelter. Tired now, cold as well and with various thoughts passing through our minds.

As the slope continued I dared to voice fresh hope to Rowland 150ft. above me and I started to watch carefully for the bergschrund that I knew would exist at the point where the steep slope met with the glacier.

Almost at once there came a muffled shout from above and peculiar hissing noise. Fresh snow which was still falling heavily was coming down the slope in powder avalanches. Digging in my axe, I lent away to prevent being prized off the slope, hoping Rowland was doing the same. The avalanche passed and we moved off quickly. More and larger avalanches started coming down, then great joy, I saw the bergschrund. 8.00 p.m. Shattered and nearing exhaustion, we

8.00 p.m. Shattered and nearing exhaustion, we viewed the drop. We needed action quickly. I jumped through what seemed like eternity, landing on the soft snow. Moving down rapidly onto the relative safety of the Papsura glacier to avoid the now continuous avalanches, we stumbled towards a safe and even flat area on which to finally pitch the tent.

All our clothes were caked in ice and the tent was still frozen solid from the previous nights bivouac. Outer clothes were dumped in the snow along with equipment but all clipped together, as by morning everything would be buried and otherwise difficult to find. Into sleeping bags still damp, no chance of a brew, a few nuts, biscuits and a chocolate bar.

Nature hadn't finished with us. It stopped snowing, but the wind rose, forcing fine powder snow through gaps in the frozen entrance into the tent, and when the wind hit the tent it shook frozen particles of condensation onto our faces. Our minds kept churning over preventing sleep. We talked for awhile, discussing the day, the climb. In the morning, $1\frac{1}{2}$ hours should see us back at advance base. The thought of endless brews.

SOUTH WEST RIDGE OF PAPSURA ROUTE DESCRIPTION

(See photo on page 20).

Overall grade T.D. Sup. 14 hours to bivouac + 5 hours to summit.

The South West Ridge starts as 1,000ft. high vertical buttress leading to a prominent snow shoulder. This buttress was avoided by climbing steep snow fields to the right (south face) which led to the shoulder. The ridge was then closely followed to the summit.

To the right of the foot of the rock buttress climb the snow slope leading to a narrow short couloir (avalanche danger). Continue above the couloir trending left through a break in the second rock band and follow open snow fields to the shoulder. 1,300ft. $45^{\circ}-60^{\circ}$.

Move to the left of the arete onto its N.W. face (risk of iced rock). Climb two pitches of mixed and IV+ then one pitch 70ft. narrow snow filled chimney V strenuous, arriving back onto the arete. Climb up the centre of the pillar for about 300ft. Delicate moves on slabs with occasional snow patches. IV+ sustained. One pitch. Trend diagonally right across steep wall. Delicate VI. Move left on slabs and continue up ridge crest. Climb a short steep wall and continue over rock thumb. One pitch of slabs IV+. Move up and tension right and ascend steep snow filled corner. (Crux) VI. Exit right through narrow slanting ice filled chimney. Short mixed pitch to snow ledge beneath overhang. Bivouac. One pitch of difficult mixed climbing followed by two pitches on snow covered rock III leading to continuous snow ridge above. Ascend snow ridge 1¹/₄ hours to large bergschrund and serac wall. Avoid on the left (N.W. face). Continue up long narrow summit ridge. Angle falling back to level summit. 1 hour.

DESCENT Via N.W. ridge towards Devachen.

Down mixed slope to right of steep, broad ice couloir onto prominent snow shoulder. Beware leaving snow shoulder too early to avoid steep rock. Follow rock edge until steep snow gangway leads off left and down into broad ice couloir. Descend couloir crossing large bergschrund. To avoid heavily crevassed area and serac fall cross glacier towards centre before descending.

JUNE 4 — 11 The Kulu Valley

On June 4, Barry Rowland and myself packed the last contents of advance base camp. Things had altered since we first arrived. Ominous depressions indicating hidden crevasses ran immediately either side of where the tents had stood and even the well worn track to the spot used for the calls of nature, was split by a rapidly developing crevasse. Devachen Papsura and White Sail shone clear against the blue sky, capturing our appreciation for the last time, but to the south the usual presence of storm clouds received little attention.

We descended to base on the East Tos glacier to find Steve surrounded by glacial swamps. The place was unrecognisable and from being frozen or buried by avalance we weighed up with some amusement the now apparent risk of drowning in the Himalayas.

George, Dawn and Tara had already set off towards the valley to meet wife, buy cigarettes and visit dentist respectively, leaving us with the task of carrying and dragging the remainder of the baggage down to temporary base, where we were to be met by three mules on June 10. The snow had melted off the glacier leaving a terrible surface of moraine. Huge unstable boulders and gravel on ice presenting a strong risk of broken bones as we balanced uncertainly from rock to rock under loads of over 50lbs. The first descent to temporary base took us over $7\frac{1}{2}$ hours and finished off what little energy we had left.

Since leaving advance base the weather had continued to deteriorate and throughout the walk back to Manikaran which we reached by midday of June 11 and our days of relaxation at Koshala, rain and cold winds made us further aware of just how lucky we had been. After a celebration dinner in Manali the team split up to undertake various plans for sightseeing, re-uniting in Delhi for the flight back to England on June 28. View from Tara Par showing l. to r. Devachen, Papsura, White Sail, Angdu Ri and Deception Peak. Papsura glacier bottom left hand corner. Photo by courtesy of 1976 Bristol Expedition.

DIARY OF MAJOR EVENTS

May 4th Advance party leave Kulu Valley (Koshala Village).

May 12th. Advance party establish temp base camp (12,000ft.).

May 16th. Main party arrive temp base camp.

May 19th. Establish base camp (14.000ft.).

May 23rd. Establish advance base camp (16,000ft.).

May 26th. First ascent of Devachen (20,300ft.).

May 28th. First ascent of S.W. ridge of White Sail (Dharmsura 21,148ft.).

May 31st. Second ascent (1st by S.W. ridge), Angdu Ri (19,500ft.).

June 2nd. First ascent of S.W. ridge of Papsura (21,165ft.).

June 4th. Final withdrawal of advance base camp.

June 11th. Last members of expedition reach Kulu Valley (Koshala Village).

GRADED DIFFICULTIES FOR CLIMBS

As particularly in the Himalayas, weather, snow conditions and state of glaciers are so variable from season to season, it's difficult to put a grade to most climbs and as with any high mountain area isolation should be considered, but as alpine style climbing is being carried out in the Himalayas, climbers need to know as near as possible the degree of difficulty encountered. Taking all factors except weather into account the grades have been given as follows:-

Papsura $\tilde{T}.D.$ Sup. (2 pitches of grade 6 and sustained at 4 to 5).

Devachen A.D. - D.

White Sail A.D.

Angdu Ri P.D.

For the readers unfamiliar with the French system of grading a very approximate translation is:—

T.D. Sup (Tre difficile superior) = A serious undertaking, sustained difficulties.

D (Difficile) = Difficulties in short sections, steep A.D. (Avez Difficile) = Medium difficulties, steep snow $(50^{\circ}-55^{\circ})$.

P.D. (Peu Difficile) = Moderate, steep snow over short sections.

APPENDIX A EQUIPMENT Rowland Perriment

As in the case of most expeditions the peculiarities of the weather in that season dictates tactics and equipment used. This year a mild winter was followed by prolonged heavy falls of snow prior to the expedition moving into the mountains. This gave us problems with snow conditions that lasted throughout. The snow remained unconsolidated and by 10.00 a.m. each day was impossible to walk on, hence a programme of very early starts and therefore unlike most expeditions we used head torches frequently.

All the climbs were accomplished using purely alpine type equipment and reduced to the minimum amount possible. Deadmen were used for belays, mainly due to the poor snow conditions but often on the steepest sections we found it was possible to find protection on protruding rock using pitons. Here hammer axes proved very useful. We found the best combination to be the leader with an ice axe plus ice hammer and the second man with just a hammer axe.

It was thought that single 9mm rope was adequate protection as apart from on Papsura the climbing was nearly exclusively on snow and would result in a slide rather than a heavy, direct fall onto the rope.Double boots were used by one member of the expedition, but we found that single boots were adequate. Each member had a pair of nylon overboots, but because high up the snow was usually dry and powdery we could keep boots dry and therefore feet warm without them. They do however help to prevent crampons from clogging up.

The breeches we had specially provided were made from double thickness wool stretch material (Helenca) and were excellent. We found the material was adequately windproof, (especially when wearing long johns underneath), and snow would easily brush off allowing the breeches to keep dry and free from freezing up. "Damart" thermolactyl underwear was praised for its warmth in the high camps and the gloves were also excellent as inners for use when operating cameras necessitated the removal of outer mitts. Expensive silk inners were used and by comparison to the "Damart" were found to be useless as they readily absorbed moisture, so losing insulation.

Packframes were very useful for load carrying. All the food and equipment was pre-packed into 40lb. loads and could be strapped directly onto a frame without having to break it down into sizes that would fit inside a rucksack, thus separating the load from its protective waterproof cover. For the climbing, the anatomical type framed sacs were popular and successful.

Again ski sticks, which we borrowed locally were found very useful for anchoring tents, probing for crevasses, but most of all for using as a third point of contact while carrying heavy loads and as a support during rests.

Powerful binoculars were found to be useful as all three main routes were largely visible from advance base camp and therefore allowing a fatherly watch to be kept on the climbers progress.

Tents — Vango supplied us with two specially produced, ultra lightweight "force ten" Mk IV tents, the inner was cotton and produced a much more pleasant atmosphere inside the tent than it if had been nylon. Weight was greatly reduced by fitting a very thin groundsheet, care was required when camping on rocks and in the high camps; the need for extra insulation was adequantly provided by a floor covering of 3mm foam and personal "Karrimats" Lightweight hoop tents home made on an improved design from those commercially available were used for the final camps. They proved yet again to be good lightweight tents, although not much heavier than a bivouac bag, they provide much more comfort, particularly over a long period. Being single skin, condensation formed on the inside but while frozen, sleeping bags were kept dry. The tents are mainly of use as an assault camp tent as if left unattended for long periods in a snow fall the fibre glass poles will snap. Spare poles were light to carry and found to be necessary.

A 12' x 9' canvas tarpaulin was acquired locally to provide shelter for cooking and storing food. This is about the smallest size advisable to give adequate cover and yet was still regretably heavy. For advance base camp we used simply a flysheet from one of the "force tens" and although too small, was all the weight we were prepared to carry. A strong nylon tarpaulin is the answer, but as the expedition got its equipment (including the tents) from England within our personal baggage allowance, we had to be very ruthless with weight and rely on what we knew to be available locally. Operating lightweight expeditions this way takes a tremendous reduction off financial and administrative burdens.

A plentiful supply of light strong cord was taken (and used) for packing, loading up mules, porters and selves, replacing guy ropes, bootlaces, etc., etc., it's easy to underestimate and can lead to infuriating problems. Although getting away from alpine type equipment, we made extensive use of a special aluminium snow shovel which we took in 1975 and left in the Kulu Valley. It proved invaluable for digging tents out of the snow and leveling tent platforms for the lower camps.

Paraffin stoves were troublesome above advance base (16,000ft.) due to the paraffin failing to vapourise properly. Possibly a combination of worn jets and low temperatures. The local paraffin is generally of a good quality.

Finally, as rice was a staple part of our diet up to the last stage, a pressure cooker was used as far as advance base. Its weight was more than compensated by the weight of fuel saved and it produced quickly prepared and better cooked meals.

No.

ITEM

- 3 man mountain tents (inc. 2 Vango specials) 3
- 2 3 man tunnel tents (Final camps)
- 2 Nylon bivouac tents (not used)
- 3mm Karrimat tent flooring
- 57 6mm personal Karrimats
- 8 Down filled sleeping bags (inc. one spare)
- 3 Complete sets of camp cooking
- 2 Half pint paraffin pressure stoves
- One pint paraffin pressure stove 1
- Pressure cooker (advance base) 1
- Personal cutlery, plates, pint mugs
- 2 Berghaus Anatomical climbing sacks (built-in frames)
- 4 Packsacks and frames
- 1 Alpine climbing sack Various kit bags, poly bags & poly prop sacks (1
- cwt capacity) pairs ski sticks 3
- 7 Whillans sit harnesses
- 5 Ice axes
- 2 North wall hammers
- 7 Pair crampons (inc. spare strap kits)
- 4 9mm x 45m Kernmantel ropes
- Drum of general purpose spindle binding
- 10 Assorted slings with nuts Assorted lengths of Perlon line for Abseil slings or Prussiks
- 14 Alloy karabiners
- Alloy Screwgate karabiners 9
- 10 Assorted tubular ice screws
- 2 pairs "Jumar" clamps (not used)
- Dead men 4
- 1 Lightweight alloy snow shovel
- Entrenching tool 1
- 1 Pair 16 x 50 binoculars personal wrist watches personal boots, clothing, inc. Duvets, overboots, etc.
- 1 Suunto compass
- Suunto Clinometer 1
- Compasses (Silva type) 5
- Low scale thermometer 1
- Distress flares (red only) 8
- "Coolite" chemical emergency lights 12
- Personal head torches & batteries
- 8 Various models of cameras & accessories
- 70 x36 exp. Kodachrome 25
- 25 x36 exp. Panotomic X
- 2 Altimeters Personal boot treatment, toiletries, etc., reading & note books.

APPENDIX B FOOD

Dawn Bean

As an expedition will spend most of its time talking about food and the rest of the time eating it, good, plentiful, well cooked food is of major importance.

We relied largely on fresh food with just a few tinned foods, all purchased in Manali. We found that compared to the 1975 expedition which relied almost entirely on dehydrated food the weight was very little more and that this year the food was more filling and offered a greater opportunity to vary the menu.

As a small amount of dehydrated food was required for the "assault rations" and is almost impossible or very expensive to obtain in India we brought our requirements with us from England. They included soup, mince, potato power, dried apple, cremola and beef curry, also brought were stock cubes which as a good meaty, salty drink proved surprisingly popular.

As we had no pre-set menu, below I've listed simply our total supplies bought in Manali, based on our estimated requirements for 7 man, 5 weeks plus rice and dal (lentils) for the porters. If we had needed the full 5 weeks the quantities would have been exactly right.

1¾kg tea

40kg rice 25kg flour 13kg dal 6kg ghee (lard) 2 litres oil 2kg salt 30kg potatoes 20kg onions 120 eggs 2kg boiled sweets 2¹/₂kg tinned cheese 40 cheese portions 2 jars of: chutney honey iam marmalade tomato ketchup

1kg coffee 12kg milk powder 30kg sugar 24kg porridge 1/2kg drinking chocolate 52 bars chocolate 23 tins sardines 5 doz boxes matches 11 boxes toilet roll 13 tins pilchards 9 pkts. of spaghetti 8 tins ham

8 tins hot dog sausages 3kg nuts & raisins 8 tins luncheon meat 60 litres paraffin

twice as much

paraffin was used when cooking at 1,600ft. as at 12,000ft. Very popular were the biscuits, cheese and tinned meat. Rice was a good stuffer, pilchards, not so appetising but in general the locally purchased food was excellent.

84 pkts. biscuits

APPENDIX C

MEDICAL

Barry Needle

The following brief notes cover the extent of the mainly minor ailments members of the group suffered. The one major incident was the unfortunate withdrawal in Manali of Les Barker with a severe stomach disorder and inflammed post operation rupture, added to the bowel upset picked up on the way to Manali and the thought of the heavy back packing led to the inevitable decision.

The medical packs were built up to give a base and advanced based unit. Each individual was issued with a small personal unit containing sufficient for 2/3 days. These were then re-stocked after each climb. To reduce weight and volume, all the drugs were in tablet form and were contained in small plastic sealable envelopes with the title, dose, etc. written on for simplicity and ease of administration. With the base and advanced base units I enclosed a list of drugs and equipment in each, along with the drug group, trade

name, form, unit dose, daily unit dose (max.). The lists were covered with matt finish Transpaseal to weatherproof them. Everything was contained in tight sealing plastic containers. For quick and easy reference for emergency First aid, I took two copies of the standard St. Johns Manual and I also had a copy of Peter Steele's 'Medical Care for Mountain Climbers', which I found easily readable for my level of prior knowledge and a valuable source of information.

Before leaving England, each member was advised to have a full medical and dental examination and to have, or update immunisations against smallpox, cholera, typhoid, paratyphoid, tetanus, poliomyelitis. The use of gamma globulin as a partial protection against infective hepatitis was discussed, but no member in the end opted for it. Each member took Paludrine daily for protection against malaria, but the daily dose was often forgotten. We were in fact hardly troubled by insects.

During the walk-in Steve Berry had a stomach disorder, which responded to treatment. There were no cases at altitude.

As the walk-in and out was comparatively short, no-one had bad blisters, just a few small ones which gave no real problems and perhaps some sore feet on the way out.

Headaches were not the problem I anticipated, but the slow approach gave people plenty of time to acclimatise. Paul did have a headache for several days and was the main suffered during the first 2 weeks.

Tara had toothache on and off at the higher camps, escalated by the cold. An attempt at filling with gutta percha proved unsuccessful, so oil of cloves and mild analgesics were used.During one particularly trying period, Tara inadvertantly took three Fortral and two Codeine tablets. The result was a very 'high' chappatie making session.

There was one case of mild altitude sickness. On the first attempt on the S.W. ridge of White Sail, Steve had a very poor night at the bivouac. He had the symptomatic Cheyne Stokes breathing, restlessness, lassitude and felt quite ill. Rowland and George accompanied him back down to advanced base camp next morning where he recovered. He later made an ascent of Angdu Ri, 19,500ft. without any undue problems. Sleeping tablets were issued, but hardly used, and were generally viewed with scepticism, fearing hangovers in the morning. Most of us did however, suffer a few sleepless hours above 14,000ft.

Sore throats again were not as bas as anticipated. I had catarrh as a result of a cold whilst marching in, which contributed to my own personal breathing problems. Fisherman's Friends proved the most popular of the throat lozengers taken.

The sun at high altitude gave everyone sunburnt areas. George had a badly swollen bottom lip for a couple of days, but no real discomfort. Several of us had sore lips, nose and ears, Piz Buin was given to everyone, but a lot of skin was still shed.

As in the Alps, crossing glaciers in the heat of the sun drained us all of energy. This year the sun seemed very strong, and some better head protection such as soft wide brimmed hats would have been useful.

Some of the supplies of medical equipment were already in Manali, being left over from the 1975 N.E.H.E. which made things a little difficult trying to decide what could be used safely and indeed what exactly was available. I would like to record thanks to the following people. My own Doctor Davies for help and advice, to Dick Colqhuitt with whom I spent a valuable evening, and to Brian Throstle for help in packaging. Since eveyone was so healthy, my services were rarely called upon, I cannot really make any constructive comments on the supplies we took, that would be of value to future expeditions in the area. Had we had a serious accident, or illness, evacuation would have been the largest obstacle to overcome.

Group	Name	Trade Name	Quantity
Analgesic, mild Analgesic, mild Analgesic, mild Analgesic,	Paracetamol	Fortral	100 tablets 90 tablets 61 tabs. in foil 59 tabs:
(moderate) Anti-biotic	Penicillin V	Tortia	82 tabs.
(gen.) Anti-biotic (broad spec.)	Ampicillin	Penbritin	100 tabs.
Anti-biotic b.s. Anti-Diarrhoea Anti-Diarrhoea	Co-trimaxazole Diphenoxylate	Septrin Lomotil Lomotil with Neomycin	72 tabs. 56 tabs: 51 tabs.
Anti-diarrhoea Sedative (nerv) Sedative (sleep) Anti-histamine		Furoxone Largactil Mogadon Phenergan	200 tabs. 70 tabs. 100 tabs. 100 tabs. & 1 tube cream
Mountain Sickness		Maxolon	100 tabs.
Diurectic Laxative Anti-malarial Antacid	Frusemide Senna Proguanil Magnesium Trisilicate	Lasix Senokot Paludrine	40 tabs. 50 tabs. Daily 100's 100 tabs.
Eyes Anaesthetic Allergic	Amethocaine		1 x 10ml.
Conjunctivitis	Otrivine Antistin		2 x 10ml.
Ears Nose:	Ear drops		1 x 11ml.
Decongestant Throat Throat Throat	Otrivine Benzocaine Co.	Tyrozets Benylets Fishermans Friends	2 sprays 24 tabs. 2 packets 20 packets
Throat Throat Throat Teeth		Dequadin Strepsils Bradosol	1 packet 23 tabs. 1 packet
Dressing Filling Cuts/grazes Mouth ulcers	Oil of Cloves Gutta Percha Gentian Violet	Bonjela	1 bottle 1 Phial 1 Bottle 1 Tube
Water Sterilisation Dietary Anti-septic Sun screen Anti-fungus		Sterotabs Vitamin C Savlon piz Buin Mycota	2 Tubes 100 tabs. 2 Tubes 2 tubes each 1 tin
Rub (aching muscles) Piles Insecticide		Lasonil Anusol DDT	1 Tube 1 Tube
Dressings	Zn Oxide strip Plasters Sterile dressings Bandages: Cotton Crepe Butterfly clips Plain lint Safety pins Surgical tape Finger dressings	Sal	ssors t tablets rker pen

APPENDIX D PHOTOGRAPHY Paul Bean

Thanks to Kodaks generous support we were able to bracket exposures thereby guaranteeing good results. The spares that resulted from such extravagance were often of use to other members of the team and so saved the expense of duplicating at a later date.

The only time when taking triple exposures isn't always possible is during a critical or exhausting stage of the climb but in general, even our "one off" shots were correctly exposed.

Due to the extremely high light factor in the crystal clear environment of the Himalaya it's better, if in doubt, to underexpose and compose the picture so that at the worst the subject appears in silhouette rather than drowned in the featureless glare of over exposed snow. This applies particularly when shooting into the sun such as early in the morning when by deliberately under exposing, each snow crystal reflects the light producing a false but dramatic photograph.

Some members of the expedition had two cameras. The heavier SLR cameras such as Pentax Praktica and Olympus were used mainly as far as advanced base. Close up lenses and extension rings were useful for recording the magnificent variety of alpine flowers and also for the SLR range we had adaptor rings for the 200mm telephoto lens. As the majority of the climbing was within sight of advance base, unlike in 1975, a telephoto lens was most useful, but over such a distance, as for example three miles and five thousand feet, (Papsura) a 300mm and the option of a 2x converter would have been much more useful.

Above advance base climbers preferred to use lighter, more compact cameras, but personally I think it's false economy. If it's the only camera taken to the summit it's essential that it's easy to operate with bulky gloves and of course reliable. It's a once in a lifetime situation you are in as you are nearing a particular unclimbed summit. The photographs you take will keep you going through wet winter weekends for the rest of your life and might be worth a bob or two as well, so don't take unnecessary risks when deciding which camera to take.

Apart from UV or haze filters which were left permanently on the cameras even in the lower valleys, where they protect the lens from dust, no special filters were used.

All our colour film was in transparency form. We had decided to use Kodachrome 25 exclusively as it's slow rating (25 ASA) is ideal for extreme light. Just occasionally, such as for camp fire or indoor shots on the approach, a faster film is better but I've found in the past that it never seems that the right film is in your camera at the right time. A suitable film should it be required would be Kodachrome 64. For the black and white coverage we relied entirely on Panotomic X. The Middlesbrough Evening Gazette very kindly printed over two hundred 8" x 10" enlargements for our commitments to firms, panoramas for the survey as well as for illustrating newspaper articles, journals and this report. Some might even make it onto the dining room wall.

To produce for these purposes, the necessary photographs of climbers in action from colour transparencies would have been costly and too slow for the urgent needs of the press therefore each climber was encouraged to always carry black and white film for quickly firing off on any interesting occasion. I say quickly because most climbers prefer to have their own colour film loaded and in order to produce a full black and white coverage the only acceptable method is to carry an extra camera specially for the purpose as we did on Devachen.

APPENDIX E

SURVEY and WEATHER

George Crawford-Smith

Survey

It was our intention to fix, with the best practical accuracy, the height and position of peaks in the vicinity of the East Tos and Papsura glaciers. The following instruments were used.

i compass, Suunto KB14/360, accuracy $\pm .2^{\circ}$

ii clinometer, Sunnto PM5, accuracy $\pm .3^{\circ}$

iii altimeter (a) Thommen 8,000 m accuracy unknown (b) Thommen 24,000 ft. accuracy

unknown

iv 15m measuring tape, accuracy within acceptable error.

Method

[A] Point Observations — Prominent observation points were selected and from them a panorama of bearings and declinations of major peaks and other observation points were recorded. The height of the observation point was recorded by altimeter.

[B] Base Line Observations — Point observations were taken from both ends of a horizontal baseline of measured length and direction.

Bearing diagrams are drawn on tracing paper for each observation point and baseline. These are then superimposed on each other — the points of intersection of the bearings giving the relative position of each peak or observation point. The map scale is determined by the baseline scale selected.

Peak heights can be calculated from declination readings once the distance is known from the peak to observation point.

Ridge and glacier details are added by observation and from photographic record.

Errors

The compass used was quoted to be accurate to a value of $\pm .2^{\circ}$. In practice mountain tops viewed from below particularly those with rounded summits may show a false summit which introduces an additional margin of error to its true position. Only one sharply pointed mountain (known for the survey as left peak) was visible from all survey points and this was used as a reference point for correlating the bearing diagrams. Two or more such points would have increased the reliability of the map. Our survey was not helped by the whiteout conditions experienced by the White Sail summit team as this was intended to be our major survey point.

Weather

Simple weather records were kept throughout the expedition. Records included time, barometric pressure, (aneroid altimeter), air temperature, percentage cloud cover and type, prevailing wind direction and physical weather conditions.

These records confirmed that the daily weather pattern was strongly dependant on the prevailing wind direction. The normal daily pattern during the final two week stage was:—

- i a cold clear night
- ii cloudless morning
- iii clouds building up late morning
- iv complete cloud cover by late afternoon usually accompanied by snow fall
- v clouds clearing just before sunset. During the first stage of the expedition however

Paul and Rowland experienced a highly irregular weather pattern with excessive snowfall. This period lasted from mid April to early May and followed an unusually mild winter season.

The prevailing winds were generally in the sector S.W. to N.W., poorer weather being associated with S.W. winds and better weather with N.W. winds. Winds from the S.W. were normally accompanied by earlier clouding and more prolonged snowfall. Conversly N.W. winds heralded less clouding and one occasions snow showers were absent.

The prevailing wind strengh (monitored by cloud movement) varied considerably during the duration of the expedition. Thunder and lightning was observed on a few occasions but there was only one local storm while at advance base camp.

Temperature and barometric pressure are, of course, altitude dependant and therefore not directly comparable between camps. Our normal temperature range was between -11° C and $+4^{\circ}$ C. These do not represent the maximum or minimum since temperatures were taken at irregular intervals throughout the working day. Therefore a min. max. thermometer would have been better.

The maximum pressure variation at any camp was equivalent to 140m of height variation (about 10mm of mercury at 5,000m height). Solar radiation at altitude is intense. Cloudless skies coupled with a reflective glacier bowl of new snow and very light local winds made the effective daytime temperature extremely high. In general we suffered more from the effects of solar radiation than lack of oxygen.

APPENDIX F FINANCIAL BALANCE SHEET

I II TI II TO II III DI		
Expenditure		£
Expedition equipment		132.14
Food		228.22
Office expenses		17.84
Travel in England		18.62
Travel in India Mules up		46.67
Traver in mana	Porters up	87.67
	Mules down	8.00
	Bus	40.34
	_	182.68
Medical	_	10.65
B.M.C. Insuranc	110.00	
Contribution to members air fares		200.35
(see note below) TO	TAL EXPENDITURE	900.50

Income

Donations — gr cc Sale of expedition	350.00 355.00 228.00 88.00	
	TOTAL INCOME	1021.00
Income Expenditure	1021.00 900.50	
Balance	120.50	To go towards

production of this report

Note: Apart from personal requirements such as film and equipment each member paid the balance of his air fare. We flew with Syrian Arab Airlines at a return flight cost of $\pounds 210$ each.

APPENDIX G

EXPEDITION BENEFACTORS

Without jeopardising our chances of success the expedition reduced costs and weight wherever possible, for apart from the climbing it was as much our aim to do so as a lightweight low budget expedition. Our financiers support was therefore put to only the most essential uses and the small amount of equipment we obtained had to be expected to serve us faultlessly — we carried few spares.

To those who took part the expedition was most successful and we hope sincerely that our benefactors can enjoy some feeling of success with us. We owe a great deal to their encouragement and generosity.

FINANCIAL SUPPORT

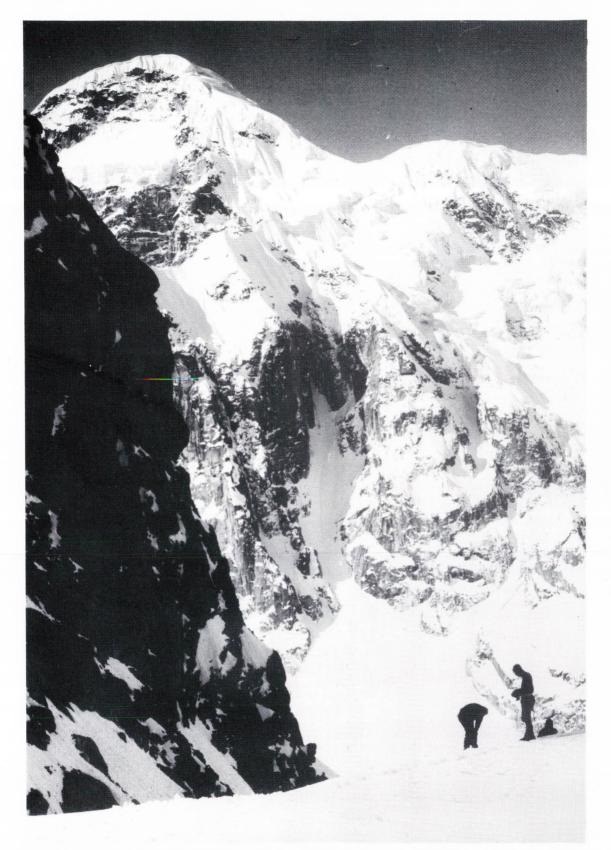
Amos Hinton and Sons. Blakedown Nurseries. British Mountaineering Council. Cleveland County Council. Cleveland Mountain Sports. Mr. Crawford-Smith. Major Cecil Crosthwaite. J. K. Fellowship of History. Evening Gazette (Middlesbrough) Lord Gisborough. Mr. D. Hinton. Mr. R. Henderson. Mount Everest Foundation. Mr. A. T. Needle. Mr. F. F. Snowden. South Yorkshire Times. Tees Towing. Vaux Breweries.

OTHER BENEFACTORS

Bachelors N. G. Bailey & Co.	— Dried Food — Thermometer
British Tissues	- Toilet Paper
Cadburys	 Chocolate
Cleveland Mountain Sports	 — all necessary
	climbing equipment
Cleveland Mountaineering Club	— Altimeter
Kodak Ltd.	— Films
H. Pickles & Sons —	Craghopper Breeches
Star Sportswear Ltd	— Socks
Studio Print	— Report
TT Phototypsetting (M'bro.)	— Typesetting
Jean Sorelle Ltd.	— Piz Buin
Vango	— Tents

THE EXPEDITION WOULD ALSO LIKE TO THANK

Mr. W. Bean. Mrs. W. Crawford-Smith. Consumer Stores — Manali. Mr. Edmunson. Mr. J. Hopps Mr. H. Parqal. Mr. R. Pettigrew. Mr. W. Sinclair. Mr. P. Wood.



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