THE AFGHAN HINDU KUSH IN 1965

A RESEARCH EXPEDITION OF THE INTERNATIONAL HYDROLOGICAL DECADE

From the University of Newcastle upon Tyne
Inter-disciplinary studies focused on climate variability, glaciology,
and the environment in the Hindu Kush

Based on the contemporary journals of Howard Horsley
In conjunction with the International Centre for Integrated Mountain Development

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This publication is available in electronic form at www.icimod.org/himaldoc

Contents

Acknowledgments

This publication would not have been possible without important contributions from numerous staff members within ICIMOD whose work deserves to be acknowledged. When I first contacted ICIMOD early in 2019 it was simply to offer copies of photos and other material to enhance historical records which might be relevant to current research. My email led to the initial interest and commitment of David Molden, the Director General of ICIMOD. Without his endorsement all records of the 1965 Expedition might have been lost as the last of its members approached the end of their lives. Laurie Vasily, Head of Knowledge Management and Communication, was then asked to take responsibility for securing an adequate record for preservation in the public domain.

While David and Laurie authorised an initial trawl of the material it was members of the Media team, led by Maxim Shrestha, who managed the transfer and compilation of the material. Particular thanks are due to Kinley Lham, a temporary intern at ICIMOD, who meticulously ensured that all the material was successfully transferred in a readable form. This detailed work took several months and was brought to a halt only when Kinley completed her internship. Thereafter, it took some time for others to assemble and evaluate all the material.

Early in 2020 Rachana Chettri, the Publication Coordination Officer, enthusiastically accepted the task of organizing the material in preparation for publication. In doing so she was assisted by Shanuj VC as editor and Sudip Kumar Maharjan who created the imaginative layout. Their judgements were important in sequencing material and in securing the highest quality images for illustrations. Unfortunately, this work was largely brought to a halt when safety concerns over the COVID-19 pandemic required ICIMOD staff to work from home for a protracted period. Despite many obstacles, the project has now been brought through to publication. Grateful thanks are now offered to all concerned.

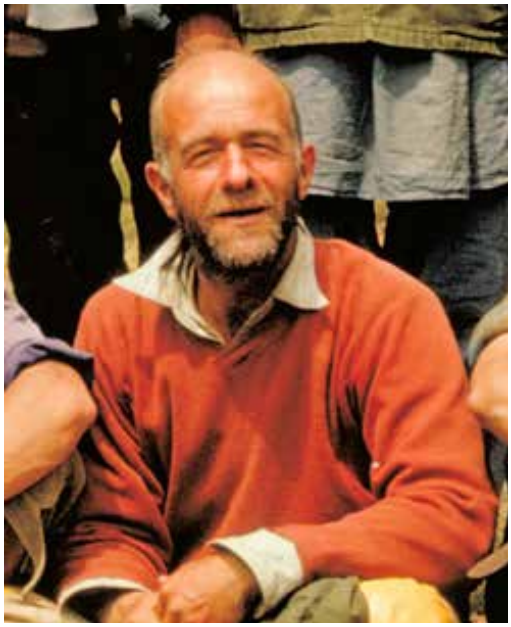
Howard Horsley

An introduction to this account of the expedition

In recent years the melting of polar ice caps and mountain glaciers has become a major source of concern. The rate of melting is increasing and is judged to be one effect of man-made global warming. The implications for human life are profound. Much of the focus in Europe has been on rising temperatures and rising sea levels. In some parts of the world, however, the threat is more visceral. In large parts of Asia, the major rivers and the irrigation agriculture that they support are largely, or partially, dependent upon abundant glacial meltwater. The retreat of the mountain glaciers in Asia has, however, only relatively recently been studied in detail.

Dr Hal Lister, Reader in Geography at the University of Newcastle upon Tyne, was almost certainly the first person to study in detail the glaciers both in the polar regions and at a high altitude in a major mountain range. As long ago as 1965, an expedition from the university studied the heat and water balance of a glacier in the Hindu Kush. This was possibly the first attempt to scientifically evaluate what was happening to the glaciers in the Hindu-Kush–Karakoram–Himalaya region. Commenting much earlier upon the findings from his work on the Greenland Ice Cap, Dr Lister had indicated his commitment to studying the balance of the ice in both types of glaciers.

The Hindu-Kush expedition was informed by Dr Lister's extensive experience on the British North Greenland Expedition and the Commonwealth Trans-Antarctic Expedition in the 1950s. As the Senior Glaciologist on each of these expeditions, he had pioneered the use of ice cores to investigate past climates. To study the meteorology, he also overwintered in isolation on the ice caps at North Ice and at South Ice. The scientific work of the Commonwealth Trans-Antarctic Expedition was interdisciplinary and contributed to the International Geophysical Year. Dr Lister embraced a similar interdisciplinary approach for the 1965 expedition, contributing to the International Hydrological Decade of the UN.


Dr Hal Lister

Members of the expedition came from different university departments and deployed a range of expertise. Dr Hal Lister was the chief scientist of an expedition led by Dr Sam James of the Civil Engineering Department. An experienced mountaineer, Sam had earlier led a climbing team to the Karakoram. Sharing the challenges faced by the expedition, their leadership achievements were very remarkable. Not least of them was our safe return. How I contrived to join the expedition, as a raw 20-year-old undergraduate, will later become clear.

The context was very different from today. No detailed maps of the region were available to consult. There were no mobile phones, no GPS, no helicopters offering rescue. Light and resilient mountain clothing was not readily available, while the tents for high-altitude use were basic in design. There were no solar panels to power experiments or to provide light. Lacking modular construction, all scientific equipment had to be designed and built from scratch. There were no computers, even to record data. Every result had to be laboriously written up by hand. Air freight was prohibitively expensive and all equipment and support material had to be transported overland.

It was a different age. After many decades of peace, Afghanistan saw a quiet general election take place in 1965. It was based upon universal adult male voting rights. The religious climate of the country was entirely tolerant and I felt confident to hike between villages all alone with no sense of fear. The warmth with which we were welcomed was always humbling. That experience has informed and deeply influenced my life as a whole. It has also sustained my continued interest in Afghan affairs.

The story of the expedition is based on my diaries and recollections as the youngest member of the team. Any errors are mine and most of the photographs are from my collection. Several surviving expedition members, including the leader, Sam James, have been supportive in preparing this account. Derek Jamieson and Dave Beynon have each made photographs available. Sadly, in the intervening decades, Dr Lister and several other members of the expedition have died. This account is a lasting tribute to them and to the work of all who contributed to the expedition's success. It would not have been possible, however, without the support and patience of my wife, Margaret, my companion in that greatest adventure in life, marriage.

When the findings were first published, they were met with a deafening silence. Half a century later, their true significance is beginning to emerge. We are grateful to the International Centre for Integrated Mountain Development (ICIMOD) for its sponsorship of this account and for the dedication of those among its staff who have carefully steered it towards publication. Most of all, we welcome ICIMOD's recognition of the importance of this baseline of interdisciplinary mountain research in the Hindu-Kush–Karakoram–Himalaya region.

Howard Horsley
Much Wenlock
February 2020

The university crest on the students' union building. This wing, new in 1965, has now been demolished.

Origins of my participation

In the 1960s before the beginning of the second year of our programme in geography at Newcastle University, all students had to choose from a range of optional courses. Michael Earl (Mick) and I chose the course in Polar Studies, led by Dr Hal Lister. He had been the Senior Glaciologist on the successful Commonwealth Trans-Antarctic Expedition. A particularly attractive feature of the course was the promise of practical experience on an expedition to Iceland, during the following summer vacation. It was right up my street. The course from the outset proved interesting. However, about a month into it, Hal announced that the fieldwork trip to Iceland would not take place as he would be undertaking research in the Himalaya, or rather the Karakoram Range of Pakistan, the following summer. It was to be the contribution of the university to the research programme of the International Hydrological Decade (that began on 1 January 1965).

Most of the students simply sighed and complained, and largely resigned themselves to the situation. However, Mick and I were more than disappointed and complained more loudly, initially to no avail. Mick had the self-confidence and savoir faire that I so markedly lacked. He came from a more middle-class background, as seemed clear to me, not least through his driving licence and membership of a golf club. Mick persuaded me that we ought to do more than complain. We made an appointment to see Hal with the aim of persuading him that, if he was going to the Karakoram in 1965, then surely, he would need two research assistants for the donkey work. It was a bold ploy and not one that I would have dared to attempt on my own. What was astonishing was that it worked. Nothing would ever be the same again.

It would be wrong for me to suggest that Hal was keen from the outset to take us. He already had an excellent, highly skilled research technician in the party, which was made up essentially of experienced staff from different departments within the university. He certainly did not want, without consultation, to accept responsibility for scrawny undergraduates, who might prove more of a hindrance than assistance. However, I guess he did not want to be seen to reject our plea out of hand.

On reflection, Hal doubtlessly also saw us as enhancing the opportunities to market and raise sponsorship for the expedition as a whole. While Hal was the chief scientist on the expedition, it was to be led by Dr Sam James, from the Civil Engineering Department, someone with a great deal more experience of high-altitude climbing. Sam was to have the final say on whether it would be safe and sensible for us to be able to join the expedition. To that end, we were invited on a series of training exercises. I am sure that none of them would have been permitted by the Health and Safety Officers of the university had the ritual of risk assessment been in place at that time.

Preparation: Joining the team

Taking part in the expedition in the summer of 1965, marking the beginning of the International Hydrological Decade, was for me, aged only 20, in some ways a life-defining event. It reinforced aspects of my character and personality, helped to develop new ones and gave me an insatiable appetite for understanding and travelling among the peoples and landscapes of the world. In this major multidisciplinary scientific expedition, I was the youngest member. The only other undergraduate, Mick, was a year older and many years later was to become Pro-Vice-Chancellor of Oxford University. Frankly, together we muscled in on the act, as I have already explained.

The expedition had its origins in discussions about glaciers in the Senior Common Room at the University. Hal, well known among the university staff as a glaciologist, had a conversation about glaciers with Sam before the latter set off to lead a climbing expedition to the Karakoram in Pakistan in 1963. Upon his return, Sam brought dust samples for Hal from one of the glaciers he had crossed in Pakistan. From Hal's earlier polar studies, he had already developed some insight into the importance of glaciers as stores of fresh water. Following conversations with Sam, he also developed an interest in the importance of low-latitude glaciers as source of irrigation waters.

About the same time, Hal learnt of an experiment that the Chinese government was undertaking in the Tien Shan mountains of Xinjiang. There, a glacier had been sprayed with coal dust to increase melting and provide more irrigation water. Hal immediately recognized the long-term risks in this strategy and gradually, he and Sam conceived the idea of an expedition to the Karakoram to investigate the sensitivity of the balance between the falling snow of winters and the melting in summer.

Dr Sam James

The initiative came at a particularly apposite time as UNESCO had begun to plan for an International Hydrological Decade to commence on 1 January 1965. This was particularly helpful in persuading the university authorities to give backing to the expedition. The University of Newcastle upon Tyne had only become an independent institution in 1963 when it separated from the University of Durham. Its first graduates, among whom I was to be one, were only due to be awarded their degrees in 1966. The expedition was an opportunity for the university to set out its stall as an important centre for research.

Before we could join the expedition's much more highly qualified and senior members, we had to begin to prove our mettle. The first and most excruciating test before we could be accepted as team members was

a weekend camping in the Cheviots. This event culminated in half a day of learning to prusik up a rock face on Simonside Fell. To those with no knowledge of this particular activity, I am tempted to describe it both as a sophisticated climbing technique and also as the nearest thing to mediaeval torture that I have ever experienced. To be more specific, on second thoughts, it was at that time potentially a lifesaver, especially for those working on glaciers. The most alarming and ever-present danger when crossing a glacier is the existence of crevasses. A crevasse is a deep gully that's opened up in the glacier by its movement. As the glacier moves over a ridge, the ice above tends to split from bottom to top. The gap, usually wide at the top, narrows at the bottom.

Things would be relatively easy if the crevasses were all visible. Unfortunately, when snow falls, it tends to sweep across the crevasses in drifts that hide their existence. One consequence is that climbers are not able to work out where the crevasses are until they fall through the snow crust into the icy depths. Crevasses open up utterly unpredictably. Three people may be walking one behind another, following in the same footsteps, and two get to cross over the bridge formed by the snow drift before the last one falls into the crevasse that his friends have escaped. This is one reason why climbers rope up when traversing glaciers.

Falling into a crevasse is extremely dangerous. You can find yourself wedged and unable to move or you may sustain a serious injury to one or more of your limbs. However, even if you escape serious injury, it can be enormously difficult to extricate yourself from the crevasse since its solid ice walls are impossible to climb. What is more, even if your climbing companions have survived unscathed, they may be in serious danger of following you into the crevasse or into other neighbouring, equally dangerous, crevasses.

Realistically, they could give you a limited amount of assistance without seriously endangering themselves, such as by securing a rope for you to use to climb out of the crevasse and by making encouraging noises while you do so. Prusiking, briefly, is the technique which one needs to master in order to progress up the rope safely. During our time, it depended upon attaching small, secure ropes to the main rope as slings to carry your weight. They were attached to allow only the slow upward movement of each small rope in turn. In this way, with a huge effort, you edged your way towards the top of the crevasse.

The prusik knot, essential to this process, prevents any movement back down the main rope. Even when fully mastered, the technique is slow, frustrating and utterly exhausting. The mere fact that both Mick and I kept going to the point of exhaustion seemed to earn us valuable brownie points on the road to acceptance. The weekend also gave us a chance to begin to get to know the rest of the team. I am pleased to be able to record that since 1965, climbing technology has improved and the prusik torture has been eliminated.


Marge James


Alan Pendlington


Dave Beynon


Oliver Gilbert


Jim Hubbick

The next training exercise was on Helvellyn, in the Lake District, in the middle of winter. It provided a real opportunity for team building and we got to know all the other members of the expedition, most of whom were members of the staff of the university in different disciplines. A few were very skilled graduates with previous experience of climbing in the Karakoram. The only female member of the group was Marge, the vivacious wife of Sam, the expedition leader. Her presence was a source of friction with Hal who seemed opposed to women joining any such expedition. The purpose of the expedition was to contribute to the research aims of the International Hydrological Decade. This was an event intended to focus on the world's need for adequate, reliable and useable water supplies for its increasing population. In the particular region we were to study, this meant examining the productivity of the montane glaciers, the main source of water for the local population. Hal Lister was the scientific leader of the expedition. Alan Pendlington, a skilled technician, also joined the expedition to assist in deploying and maintaining the scientific equipment. Jim Parry, a physicist, was to carry out geophysical research on the emerging theory of the continental drift of tectonic plates.

Sam James, the overall expedition leader, a lecturer in the Civil Engineering Department, was around thirty and a seasoned mountaineer. His scientific role in the expedition was as a limnologist, studying the productivity of the high-altitude lakes. His wife, Marge, was to join the expedition to strengthen its climbing capability. Another member of the civil engineering staff was Derek Jamieson, a hydrologist, who would play a pivotal role in the scientific work alongside Hal. Derek later became a Professor at the School of Civil Engineering and Geosciences at the University of Newcastle upon Tyne.

Dave Beynon, our dentist and a mountaineer, was later to become Reader in Dental Anatomy at Newcastle University. His main research, for NASA, involved examining the impact of a prolonged soft diet on dental hygiene, essential in preparing for manned space flight. A secondary project was to explore dental evidence of ethnicity among the varied peoples of the high-mountain valleys. Pat Hurley, another member and a GP trained in Newcastle, was a very experienced mountaineer, and a highly regarded ornithologist whose research was on the effects of altitude on performance. This project had been funded by the Medical Research Council. It aimed, among other things, to provide some baseline data in preparation for the acclimatization of athletes for the 1968 Olympics, due to be held for the first time at a high-altitude venue in Mexico City.

Oliver Gilbert was an equally experienced climber and a research botanist who was to collect seed specimens for the national collection at Kew Gardens. In later years, he became a Reader at Sheffield University and Britain's most esteemed lichenologist. Jim Hubbick, another very experienced climber, was a teacher and Newcastle University graduate in biology. Other members of the original team later withdrew for a variety of reasons, personal and professional. We climbed up Striding Edge in snow while much of the rock beneath was coated in ice. It was my first experience of roped climbing but I proved myself fit and fearless, if only because I was not yet fully aware of the dangers. From the top of Helvellyn, we practised jumping off and using our ice axes to limit and eventually stop our movement. It proved a good team bonding exercise, if rather an inadequate training for a full-scale high-altitude climbing expedition. From that weekend, Mick and I became an integral part of the expedition.

Making personal preparations

There were also academic issues which needed to be resolved urgently within the Geography Department. In the forthcoming summer vacation, we were scheduled to complete our undergraduate dissertations. There had to be agreements to permit us to submit either earlier or later. Then there was a need for clarity about our precise roles in the expedition and the planned training in those roles. There was also the tricky issue of finances. We would not be able to participate without making at least a nominal financial contribution. On this occasion, my father came to my rescue and gave me the £100 to ensure my participation. This was a substantial sum and must have been a considerable sacrifice. For my own part, all the preparations meant I had no vacation time to devote to paid work. What is astonishing in retrospect was the equanimity with which my parents agreed to my taking part in the expedition.

Mt Rakaposhi in the Karakoram Range of Pakistan

Gradually, the outstanding issues were resolved and we found ourselves assisting Hal in preparing and testing his scientific equipment. We are talking about a time before modern portable computing. Today, we take for granted the reliability and portability of all kinds of scientific monitors. In the mid-1960s, each individual piece of equipment had, in most cases, to be specially commissioned, designed, constructed and tested. Hal was fortunate in having, in Alan, an RAF-trained technician capable of making most of his equipment.

Our job was to work with Alan in testing and calibrating the equipment before departure. The work of the expedition was initially planned to take place in the Karakoram mountains of Pakistan. I picked up the task of liaison with Dr J. Edwards at the university in Lahore; he was to provide research guidance and put us in touch with good interpreters who could assist us. In that way, I gained access to a wealth of research sources which immeasurably improved my background knowledge. It was only several decades later that I was able to take a photo (on the left) of Mt Rakaposhi in the Karakoram Range of Pakistan, close to our original destination.

The early months of 1965 became a whirl of activities involving several elements: our continued studies; our personal, technical and climbing preparation; and completing, in advance, elements of our dissertations. It had been agreed that we could split our dissertations into two parts, one to be completed before our expedition, the other to be completed on our return. Over the Christmas vacation, I began, researched and started writing a minor dissertation on applied geography as related to the coast of Central Ayrshire.

This was a convenient place to study as my cousin and her husband lived in Troon and I had already visited them on several occasions. I completed my first-hand research on the ground and also studied in prestigious Scottish libraries. The finished piece, to say the least, was hurried, and not something that I would ordinarily have submitted without a thorough revision and rewrite. But its virtue was that it met the technical requirements and freed me up to concentrate on the preparation for the expedition.

In the constant quest for financial sponsorship for the expedition, I played a part in handling the publicity. Apart from preparing articles for the press, I was also asked to appear on the local BBC TV news magazine, after the early evening news. It was a salutary experience in the ways of journalists, for I was hastily briefed on the questions I would be asked and was then asked quite different questions. What made it more testing was that the interviewer had himself been badly briefed on where we were going and what we were intending to study.

Somehow, I managed to make a reasonable fist of the interview. What would surprise anyone now was the miniscule size of the studio in this early period of live black-and-white TV broadcasting. Moreover, to get a picture of the interviewer and interviewee together on the screen

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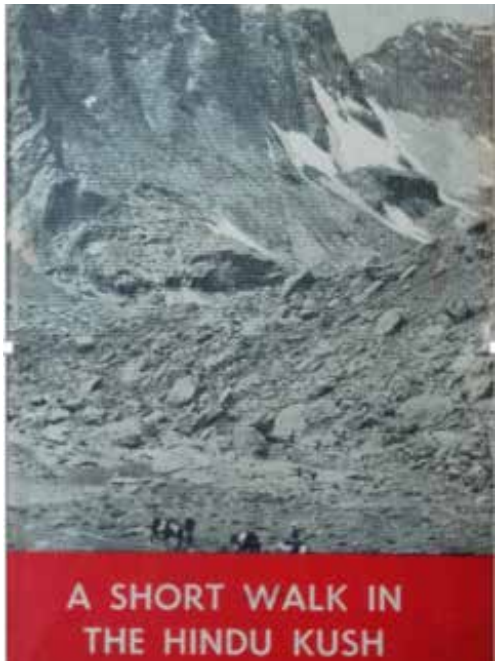
with the primitive equipment, we had to almost sit on one another's laps. The camera was huge and extremely intrusive. In summary, one felt as if one were just about to headbutt the interviewer while being attacked by a huge mechanical object.

Eventually, things came together. I managed, for the first time in my life, to acquire a passport. Mick and I completed an extensive course of vaccinations. This was more stressful than I had anticipated. On each and every occasion, Mick passed out when the needle was inserted. This was hardly reassuring for me as I waited in line behind him. Somehow, I managed to cope without any drama. Gradually, both of us got kitted out with the appropriate personal gear and were also issued ice axes and crampons.

Equipping the expedition

Two sturdy vehicles were acquired, a new, long-wheelbase Land Rover and an ex-army Humber 4x4 truck with a Rolls-Royce engine. Among our most generous sponsors was the Anglo-Iranian Oil Company. They were to provide the majority of our fuel. Peek Freans, a firm with a long history on the Indian subcontinent, provided dried and tinned food as well as some huge slabs of fruit cake. We also had slabs of iron rations in three varieties with which we became all too familiar. For a very welcome variation, we had ample supplies of three varieties of Vesta dehydrated food. The army made available redundant lightweight aluminium-carrying frames for us, while Benjamin-Edgington provided tents at a discount. The majority of our provisions, suited to high-altitude life and sufficient for three months, as well as all our camping equipment and scientific instruments, had to travel with us overland. It was both a tall order and a considerable logistical challenge.

We were in the last stages of preparation when India and Pakistan went to war. The war meant that a trip to the Karakoram became out of the question. It had become a war zone. We were left in what seemed at first to be an impossible situation. However, Hal soon came up with an alternative plan. He suggested that our work could be undertaken reasonably well in the Hindu Kush mountains of Afghanistan. He had read, sometime previously, a book by the well-known travel writer Eric Newby called A Short Walk in the Hindu Kush. A re-examination of the book had persuaded him that there were glaciers in the Hindu Kush large enough to enable us to successfully carry out our research. We all heaved a sigh of relief and began to explore this new option.



Eric Newby's book

Once it had been agreed that we should proceed, there was much to be done. First of all, however, there was a need to get permission to enter Afghanistan and conduct research in the Panjshir Valley. Hal and Sam had to rush down to London and negotiate agreements at the embassy. This was no easy matter at the height of the Cold War in a country sharing a lengthy border with the Soviet Union. When an agreement in principle had been reached, there were also visas to be obtained and other paperwork to be completed. Documents were needed for the vehicles and international driving licences for the drivers.

The research I had begun into the Karakoram had to be put aside. The letters that had gone backwards and forwards between myself and the university in Lahore were no longer relevant. I had to begin to do some fundamental research on the Hindu Kush. It was not encouraging to find that the very name meant "Hindu Killer". Ibn Batuta, the

Our two heavily loaded vehicles in Austria

The majority of our provisions, suited to high-altitude life and sufficient for three months, as well as all our camping equipment and scientific instruments, had to travel with us overland. It was both a tall order and a considerable logistical challenge.

greatest of the medieval travellers, had noted that the name originated from the number of deaths among the slaves taken from India by their Afghan conquerors. It was even less reassuring to note the view of modern writers that more explorers had disappeared without a trace in the Hindu Kush than in any other part of the ranges linked to the Himalaya. I determined to push these thoughts to the back of my mind.

The last few weeks before departure were a whirl of activities, culminating in packing the vehicles. There was all the research equipment, all our camping equipment, all our personal kit as well as material for first aid and emergency breakdown. Then there was a substantial quantity of dehydrated food for the time we would be in the mountains, far away from local food supplies. Most of the gear was packed into labelled tea chests for ease of locating individual items. It was at this stage that I suddenly came into my own, finding that I had a level of spatial awareness which made me by far the best of the team at packing. This turned out to be a double-edged sword, for our vehicles left on their journey with little room to spare and carrying much more than their designed weight limits.

There were initially expected to be 16 expedition members and the plan was for half of us to drive overland on the outward journey and the other half to drive back. The outbound team consisted of Sam and his wife, Marge, myself and Mick, Jim the biologist, Oliver the botanist, Dave the dentist and Derek the hydrologist. There was no bench seat in the truck, so it could only take two. However, those in the truck had rather more space than anyone else. I hardly ever got to enjoy that luxury as I was the only member of the party unable to drive. Being without a driving licence, I was destined to be a passenger. The six seats in the front of the long-wheelbase Land Rover were always fully occupied. It was quite a squeeze and promised to test our patience with one another on such a long journey.

Crossing Cold War Europe

We finally left Newcastle on 8 June 1965. Describing in detail a journey of several thousand miles, taking almost a month, would be no easy task and would poorly reward the effort involved. However, there are features of the journey as well as highlights that remain worth recording. The main characteristic of the journey as a whole was the feeling of being constantly on the move all day and often well into the night. As we moved further east into the deserts beyond the Caspian, there was an additional element of constant heat and dust. Throughout, we snatched sleep whenever and wherever we could. Rarely after the first few days were we all awake in the Land Rover for more than a couple of hours. There was also the discipline of several research projects to undertake along the way, some with metronomic regularity.

To someone like me, who had never even left the UK before, no part of the journey was remotely boring. The variety of scenery along the route was as fascinating as the variety of cultures through which we passed. To add to the sense of awe, I was treated to an unrivalled insight into ancient worlds, which was provided by the changing traditional architecture and the remains of long-abandoned cities, towns, places of worship, roads and bridges.

Manual labour on a Yugoslav collective farm

Crossing the Channel at night was more than anything else an immense relief after so many setbacks and such a last-minute rush to complete our documentation. We had to pick up our passports with visas from the Afghan Embassy close to Hyde Park on the way to Dover. I kept quiet about the fact that I had never been to London before. Later, we picked up some high-altitude tents at the Benjamin-Edgington Factory. We caught the midnight ferry in the nick of time and our overloaded lorry was the very last vehicle allowed aboard.

Most of us managed to snatch a couple of hours sleep before disembarking in Zeebrugge at half-past three in the morning. Belgium, Germany and Austria seemed to flash past in a haze in the first few days. I will never forget one of our team members trying to park beneath the castle in Salzburg. Just as he was reversing into a parking place, a German Volkswagen stole the space in manner reminiscent of the later conflicts which were to arise for the British tourist over poolside loungers along the Costa del Sol. The teammate, who shall remain nameless, expressed his rage by bellowing loudly and highly undiplomatically: “Who won the bloody war then?”

Our next overnight stop was at Graz in eastern Austria, where we found a lovely campsite, and in the morning, after breakfast, we refuelled our tanks. A dramatic change came the next day after crossing into Yugoslavia. The transition from a democratic Western Europe to a communist Eastern Europe was highly significant. The mid-sixties marked the very height of the Cold War. It was no great problem to get across the border though the

Bullock cart transport in Yugoslavia

For the first time I saw carts, drawn by bullocks, being used as the main mode of transport. To someone of my age, it looked like something from another century; in reality, it might have been a typical scene from Western Europe in the 1930s.

bureaucracy was slower than usual. What was immediately noticeable, however, was the relative poverty and backwardness of Yugoslav agriculture.

For the first time I saw carts, drawn by bullocks, being used as the main mode of transport. To someone of my age, it looked like something from another century; in reality, it might have been a typical scene from Western Europe in the 1930s. It was true that there were well-built motorways throughout Yugoslavia along which we could drive. Sadly, apart from military traffic, they were almost entirely empty of other motor vehicles. What was visually astonishing was the extensive use of human labour in the fields. We saw huge collective farms where immense fields, stretching into the distance, were being hoed and weeded by large teams of peasant labourers, both men and women.

If Yugoslavia was strange, then Bulgaria was something entirely different. We may, it is true, have been under invisible surveillance in Yugoslavia, but in Bulgaria, there was no attempt to conceal the situation. As was mentioned earlier, we had research to complete along the entire route of our long journey. It was in Bulgaria that one of our projects began to seem rather alarming. As part of a research project for NASA, the US space agency, Hal had been asked to measure the changing angle of the slope of land at regular intervals. This was information which was intended to provide a comparative baseline for understanding something about the surface of the moon and the planets. To undertake this task, Hal had provided us with an accurate means of measuring distances. Unfortunately, this device was nothing less than a rangefinder removed from a Howitzer. You will no doubt appreciate that we had serious concerns, as to how we might explain our behaviour and our equipment if challenged by the Bulgarian secret police.

All along the roads, checkpoints were highly visible at regular intervals, and registration details were consistently recorded, along with the time of passage. This was clearly a country where travel was very carefully controlled. Luckily, we were never challenged. Knowing now so much more about the dreadful reputation of the Bulgarian intelligence services, our behaviour in the country seems, in retrospect, to have been reckless in the extreme. However, despite these lingering worries, there were several pleasant surprises for us in Bulgaria, not least of them the quality of the landscape. Both mosques and churches had survived the communist ideology and the abundant local birdlife made no religious distinctions. Huge white cranes made their visually stunning nests atop both towers and minarets.

The urban centres were equally surprising. Sophia turned out to be no typical nightmare of communist functional architecture, but rather an elegant city of squares and boulevards. Sadly, in the years to come, its good qualities would largely seem to be obscured. It was more reminiscent of Vienna or Paris than of East Berlin. Plovdiv may have been less exciting architecturally, but it was redeemed by the extensive fields of roses around and within its limits. The purpose of all this floral extravagance was its perfume industry.

Crossing into South-West Asia

After almost a week on the road, we arrived in Turkey where we were surprised by the constant visibility of the armed forces; but we shouldn't have been, for the country was ruled by a military regime. We stayed at a very well-run campsite in Edirne, the ancient capital of the Roman province of Thrace. We had little time for its historical sites, but at the campsite we enjoyed an excellent swimming pool with a wonderful view of the town's huge mosque, one of the most stunning achievements of Islamic architecture. The next day, we rapidly covered the remaining 250 km to Istanbul from where we would eventually cross into Asia. On arrival, we got a full day to explore the city. Meanwhile, our vehicles were given a thorough service so as to be ready for the rigours of the rough roads across this huge country.

In Istanbul, we walked beside the city walls before paying a visit to the dramatic Blue Mosque. Later, we explored the narrow streets around the busy Golden Horn and enjoyed an afternoon tea at the elegant Pera Palace Hotel. Built in the dying years of the Ottoman Empire, it was the terminal hotel of the Orient Express, and for many years the only building in Istanbul – other than the Ottoman palaces – lit by electricity. It was the setting for over a century for some of the more extraordinary meetings of diplomats and spies. In WWII, a German spy had planted a bomb within its bar, killing a British diplomat.


The Blue Mosque in Istanbul

Those were the years long before the building of the Bosphorous Bridge, and the short ferry crossing to the new exotic continent of Asia remained a significant adventure. Beyond, I became aware for the first time of the abundance of astonishing archaeological sites, such as the ruins of Heracles near modern Ankara. The enormously lengthy journey beyond the Bosphorous across Asiatic Turkey also proved to be a staggering revelation.

Beyond Istanbul, accredited campsites were few and far between. Most nights, we found ourselves coming to a halt, long after dark, at some random spot, determined mainly by our increasingly dangerous state of exhaustion. The dryness of the landscape seemed to make erecting tents an unnecessary and time-consuming luxury, so we frequently simply cooked a simple meal and slept beneath the stars. One lucky person usually found enough room to stretch out across the back bench seat of the Land Rover.

As the only non-driver, I had to be up early each day to mastermind the logistics. This meant early packing of everything not essential for breakfast. It also required me to pack things in a systematic way to ensure that essential supplies were accessible and I had to keep a close check on drinking water supplies. These were a constant worry as this was long before the unlimited availability of bottled water worldwide. It was also a revelation, as later, on several occasions during our drive across Iran, we had to rely on the local

We often camped wherever we ran out of energy

A lovely village landscape in eastern Turkey

people to draw water from their wells to fill our main containers. It was by that means that I eventually became familiar with the deep qanats. For many centuries, they have been miraculously and gently channelling water from the snow-capped mountains in cool tunnels beneath the desert, thus providing water for even the most remote communities.

"Yavas" was the hilarious and constant yellow road sign across Turkey. Its intention was to urge drivers to slow down. On roads that for hundreds of miles were less well maintained than the average Yorkshire cart track, the appeal seemed redundant. Redundant that is until you observed the behaviour of some of the Turkish truck drivers. However, as we travelled further east, we encountered fewer vehicles of any kind. At the same time, the scenery became ever more foreign. First, there were the many rice paddies of the Turkish plateau. Then we headed north from Ankara and were soon dazzled by the azure waters of the inappropriately named Black Sea between Samsun and Trabizon. On one occasion, we actually got to swim briefly in its unaccustomedly warm water.

Heading back inland to the mountains, I had the increasing impression that we had entered a world still dominated, in the second half of the twentieth century, by the biblical donkey as the prime means of transport. It was an impression that continued to grow as we travelled onward across Iran and Afghanistan. Among many beautiful settlements to admire was a small village in Armenia. Its buildings

Among many beautiful settlements to admire was a small village in Armenia. Its buildings were constructed so authentically from local materials that they seemed a part of the natural landscape.

were constructed so authentically from local materials that they seemed a part of the natural landscape. There were also, amid such beauty, some extraordinary and alarming moments along the way.

Among the worst was waking up atop a pass in eastern Turkey to find men with knives standing over us as we lay in our sleeping bags. In reality, it was not as threatening as it first seemed to be the case, for the pass was the location of the local open-air butchery. By the time we got up, dressed and had breakfast, a cow had been slaughtered, skinned and was well on its way to being butchered and sold. The scene was extremely colourful. Another alarming experience, related by Derek, had to do with his attempt to keep the overloaded truck under control in descending a particularly steep pass. Without disc brakes, he was almost overwhelmed by the smell of the brake shoes rapidly burning away.

We headed eventually onto the high plateau, around Erzurum – the chief city of Anatolia – lying at about 6,000 feet above sea level. This is a land where spring is always late and we found oxen still striding back and forth harnessed to the plough. From the plateau, streams flow south and form the headwaters of the mighty Euphrates. Later, towards the north-east, as we approached

Camping atop desert ridges in Iran

We eventually stopped for the night as darkness fell and camped precariously atop some mini ridges, since there seemed to be no flat land other than the road surface.

the Iranian border, we were accompanied for almost a day by the distant sight of the glaciers and snowfields atop the summit of Mount Ararat. It was there, in ancient times, that Noah's Ark is said to have come to rest. Beyond it, in our own times, lay the inaccessible lands of the Soviet empire. It was staggering to imagine the hardships of the Turkish armies that had fought their way across this high plateau in the depth of winter during WWI in an attempt to capture the vital oilfields of the Caucasus for their allies far away in Germany.

By the time we reached the border, we had spent a full week traversing Turkey from west to east. The border post was isolated and remote. Crossing into Iran proved slow and laborious, so we fell behind our intended schedule. We eventually stopped for the night as darkness fell and camped precariously atop some mini ridges, since there seemed to be no flat land other than the road surface. Awaking with the sun at four, we found ourselves in the most amazingly colourful, jagged ridges of a red-, orange- and white-striped desert. Amid them, we also saw the smoking summit of a small volcano.

It was on this stretch from the border to Tabriz that we had one of our worst punctures. A passing Iranian truck driver had to help us to change the wheel. The truth was now exposed – our vehicles were overloaded and the tyres were shredding on the jagged road surfaces. The next day we passed quite rapidly through Tabriz, a modest urban centre, though at that time the second-largest city of Iran. Despite the absence of sand dunes, by now we were beginning to feel the desert heat and to suffer from the constant dust. The occasional visually stunning compact village emerged from the almost barren landscape glowing green like some amazing river-fed oasis.

Beyond Tabriz, the road towards Teheran was soon transformed into a metalled highway. It was as good as any in Britain and our progress became much more rapid since the traffic was very light. When we arrived in Teheran, it was a gleaming revelation of prosperity, quite atypical of the country as a whole. This was the Teheran of the Shah, the King of Kings, and a land of obscene excesses. Based on seemingly unlimited oil wealth, managed by the Anglo-Iranian Oil Company, the Shah's corrupt regime would eventually collapse in the dramatic Islamic Revolution 14 years later. For the moment, we were only too grateful to Anglo-Iranian Oil, the company which was a major sponsor of the expedition, providing free fuel and regular free servicing for the vehicles.

Teheran was a long-planned venue offering an opportunity to service our vehicles once again. They had taken quite a hammering on the rough roads between Ankara and Tabriz in particular. Moreover, the toughest part of the journey was still to come. Unfortunately, we arrived on a Friday, the Muslim day of rest. The halt was therefore extended from 24 to 48 hours. This gave us the chance to take breath, for we found no campsite and stayed instead in the Caravan Hotel. There we were able

Sunset close to the Caspian

By the next evening, we had traversed the mountains with their unexpectedly green forests, and emerged, as the sun set, onto the plateau around the Caspian Sea. It was a dramatically beautiful scene as a red glow spread across endlessly flooded fields of rice paddy.

to catch up on some lost sleep. We also managed to enjoy some excellent meals at German Restaurant, which some members of the party had visited on previous trips. Sadly, it was not a restful time for all, as several party members fell ill. While in Teheran, we also heard from Hal that three of the party, expected to join us in Kabul, had unexpectedly withdrawn from the expedition.

Leaving Teheran late in the evening, we began the dramatic ascent into the cool air of the Elburz Mountains to the north, before camping in a gorge for the night. Mick was the sole member of the party who remained ill at that time, so he had the privilege of the back seat of the Land Rover for the night. By the next evening, we had traversed the mountains with their unexpectedly green forests, and emerged, as the sun set, onto the plateau around the Caspian Sea. It was a dramatically beautiful scene as a red glow spread across endlessly flooded fields of rice paddy. Once again, we struggled to find a suitable place to halt for the night. The next morning, as we awoke, Derek was leaping about, having found that the scrub where we had slept was alive with deadly scorpions.

It was to the east of the Caspian lowlands that the roads began to deteriorate really badly. We were soon among the ridges cut into a high plateau. The desert was now more barren and desolate than anything we had seen before. Villages became few and far between. Within them, the small, domed houses clustered together as if to provide shelter from the cold winds of winter and to preserve an element of shade in the heat of summer. One remarkable feature was the occasional huge, horizontal Iranian windmill.

The air temperatures were now extraordinarily high. The vehicles were red-hot to the touch and this was long before air conditioning became normal. It was easy to imagine that the vultures squatting on the rock outcrops beside the rocky road were awaiting our demise. As we swept eastward, a cloud of dust swirled permanently behind each vehicle. Not stopping for even a moment, other than to refuel to the maximum, we drove straight through the historic, religiously and strategically vital city of Mashad. We then toiled urgently on, aiming to cross the Afghan border before dark.

Into Afghanistan

Our long-anticipated crossing into Afghanistan late on 29 June 1965 marked the end of our third week on the road. It was a slow crossing with maximum bureaucracy and delay, but since it was sundown, it was at least relatively cool. Having crossed shortly before the border closed for the night, we camped overnight close to the border. Ordinarily, we would have continued on our way for as long as we could remain alert. We certainly had no wish to travel far in the heat of the day if we could avoid it. The next day, we rose very early, taking advantage of the cool dawn temperature. Repacking the stores, which were disturbed at customs, we got underway before the sun rose too high.

Alongside the road, we passed a number of laden camel caravans that might have been from a long-bygone age. We made reasonable progress and arrived in the ancient city of Herat before midday. The heat was stifling and the streets dusty. However, one could not be unaware of Herat's great history, for huge minarets of great age dominated the skyline. We were soon installed behind the thick walls of the very basic Hotel Park where it was cool enough for us to snatch some sleep. Basic it may have been, but its primitive cold showers were a luxury beyond our wildest dreams, and all of us made use of them.

A camel caravan

Herat had long ago been regarded as the gateway to India from Central Asia. Conquered by Alexander the Great, it was once known as Alexandria in Aria. A millennium later after the spread of Islam, it was conquered by Genghis Khan. Later came Tamerlane and then Babur, the first Mughal emperor; then it was coveted in the nineteenth century by the Shah of Iran. He saw it as a valuable asset to be bargained with in the "Great Game" being played out between Britain and Russia. The control of the city had been the purpose of a prolonged siege in the 1830s and the Anglo-Persian War of 1856. Set amid the vastness of the desert landscape, Herat's dusty streets and battered buildings made it difficult to envisage it being so consistently hard-fought over by foreign armies so far from their homelands.

While resting at the hotel through the midday heat, I supervised the replenishing of our water supplies. The water was drawn up from a deep well within the hotel compound. The local staff lifted it by hand with a bucket fastened to a coiled rope which lay on the cover of the well. The length of the rope dramatically demonstrated the great depth of the well. Meanwhile, the other members of the team drove off to fill up the vehicles with fuel. As soon as the heat of the day had passed, we headed out of town along elegant, tree-shaded boulevards with gutters on its margins through which cool water rippled in a constant stream. These were fed by complex watercourses from distant mountain ranges.

We were soon on the brand-new and mighty impressive Russian-built road stretching from Kushka on the Soviet border down

The road from the Soviet border

We had had several punctures in the last few days and we took time to get repaired those tyres that could be and replace those that couldn't be.

through Herat to Kandahar. In the middle of the Cold War, there could be no doubt about its hidden message. This was a road built to take tanks. What made this particularly obvious was the total lack of traffic travelling on it. On one occasion, we drove for an uninterrupted hour without running into any kind of traffic in either direction. There were not even communities – large, small or even tiny – to serve anything alongside the road. This was the most desolate piece of landscape we had seen on our entire journey.

But the travel was more enjoyable than the previous stretches since there was no dust thrown up by other vehicles. Till then, for many days, we had, with astonishing regularity, had to close the windows and ventilation systems to avoid being choked with the dust which swirled around. The situation had also necessitated the vehicles to travel several miles apart in order to reduce the dust from the vehicle in front. By seven in the evening, we had covered about 200 miles; then we halted to make a cuppa and eat an evening meal. It was pitch-dark before we set off again.

Even in the darkness, the air remained very warm and we were intermittently attacked by hot blasts throughout the hours on the road. Eventually, the road itself disappeared and we headed off hesitantly through the desert in the darkness. Luckily, it was just a short section under repair or construction and we were soon back on the road. We did not halt until midnight and then simply collapsed beside the road. One of the most remarkable features of such a desert environment is the utter silence. I remember smoking a cigarette before going to sleep and listening to the sound of the tobacco slowly burning.

By half-past seven the next morning, we were organized and had breakfast before heading off towards Kandahar, yet another city once conquered by Alexander the Great and called Alexandria Arachosia. The ancient name is still reflected in the modern one, for Iskanderia gradually evolved into Kandahar. To our delight and astonishment, the tarmac road remained good all the way and before midday we were installed at the illustriously named Hotel de Kandahar. It turned out to be a dive, the like of which I had never seen before and have rarely seen since. We remained there in the shade throughout the day, for lack of any better alternative to avoid the searing heat. The overall state of the place could best be judged by the fact that the piles of dead flies and cockroaches on the concrete corridors were so thick that columns of voracious ants had formed to devour them.

We had had several punctures in the last few days and we took time to get repaired those tyres that could be and replace those that couldn't be. There were hasty showers to be taken and fuel to be acquired. My job was once again to supervise the replenishment of our water supply. Again, it was drawn from the hotel's own well. At six, in the cool of the evening, we got underway and drove off towards Kabul, the Afghan capital. This time we took not a Russian but an American road. Once again it was luxurious tarmac. This road was the Cold War reply of the US to the more northerly Russian road.

A street scene in Kandahar

Wear and tear on our tyres

It was obviously designed to allow the US forces to travel from Quetta in Pakistan across the Bolan Pass to Kandahar and then on towards Kabul on a continuous, well-constructed piece of gleaming roadway. It looked like our troubles were over and we could look forward to reaching Kabul without further problems. How wrong we were. It was some time after midnight that we, in the Land Rover, noticed something wrong with the truck, which was in front. Our headlights showed that one of the rear wheels of the truck was wobbling. We signalled, and Derek, who was driving the truck, drew to a rapid halt.

It was immediately apparent that this was something much worse than a simple puncture. There was nothing to be done in the middle of the night, so we piled out and bedded down beside the road. It was, however, a short sleep as we were up at dawn to evaluate the best course of action. While some cooked breakfast, others tried to work out what had happened. We had jacked up the truck in the dark, in an emergency sort of a way, and now we did a more careful job. It soon became clear that taking off the wheel and tyre in the normal way had become impossible.

An emergency roadside camp

The fact was that the overloading of the vehicle had put undue pressure on the bolts retaining the wheel on the axle. As a result, they had broken loose and the nuts which held the wheel in place turned freely along with the bolt. There was an open debate on what to do next, but no ready solution came forth. After thousands of miles and with only 180 miles to reach Kabul, we had come to a shuddering halt. Several truck drivers stopped and seemed keen to offer help. However, when they saw the extent of the problem, they merely shook their heads. They were just as powerless as we were in tackling the situation. That something drastic had to be done was becoming ever clearer.

What is more we had no time to waste, for the new members of the party were due to arrive by air in Kabul within 24 hours. We needed to be around to meet them. The brutal option of trying to drive on until the wheel broke off seemed, for a brief moment, appealing. However, it risked more permanent damage to the vehicle as a whole and to all the gear that we were carrying. It was pointless to risk irreparable damage to our essential scientific equipment. Moreover, we had stopped at a quiet location on a straight piece of road, far from a town or even a village. If you had to be stranded, this was a relatively good place to be stranded. The only other option was a very laborious and time-consuming one.

We decided we would have to try and saw through each of the eight bolts and nuts in turn. This was the only way to get the wheel off and then disassemble the half shaft and

Scene beside the American built road

axle to get the new bolts fitted. Finally, we would have to take the entire assembly in the Land Rover into Kabul and try to find someone who could reconstruct it. It was a long shot, but it was all that was open to us. The first thing was to see if we had enough saw blades to do the job. We calculated that we just about had enough, but only time would tell what damage would be done to them in the process. It was immediately apparent, however, that we would have to break the blades in half or thirds and hold them in our hands to complete the task. There was simply too little room within the wheel arch to accommodate even a full blade, let alone a blade complete with its holder.

It was excruciating work and we each took our turn. It was not work that the hacksaw blade had been designed to do, even when clamped in a proper saw frame. Nobody could manage more than about 10 minutes at a time. Your fingers just got too sore. What we were doing was to saw down the length of each bolt and cutting though the nut at the same time. Then we would be able to peel each half nut from the bolt and release the wheel. Just getting started was difficult enough. It was hard to make the initial crucial impression on the hardened steel. The first bolt took over an hour to saw through, even when a chisel and a hammer were used to finish off the job. Taking that as a measure, we knew we had a job lasting about seven hours before it could be completed.

We managed to fit up an awning so as to shelter the sawyer from the sun. Meanwhile, some of the group headed off to the nearest town in the Land Rover to fill up with fuel, to replenish our water and to buy fresh food. Others took advantage of the situation between their turn with the saw to climb to the nearest viewpoint, making sure first that they had sunblock and shade-offering headgear. A short climb provided our first vista of distant snow-clad mountain ranges. There was plenty of time to study the flora, fauna and landforms of the immediate desert landscape. A deeply cut dry riverbed lay nearby and I recall being fascinated by the sight of dozens of colourful bee-eaters flitting in and out of the holes in the riverbank in which they had made their nests. Oliver, by now known as Olly, continued with his customary enthusiasm to search for new botanical specimens. Mostly, we sought shade as the sun rose higher into a cloudless sky and the temperature soared.

It was obvious by now that the party would soon have to split. Several members would have to remain behind to ensure the safety of the truck and its contents pending our return from Kabul, hopefully with the axle assembly fully rebuilt. Given the mythical tales of brigandage in Afghanistan, there was no strong competition to be the members of the group to remain marooned in the middle of nowhere for an indefinite period. Things got even more complicated when two of the party, busy with the saw, blew the metal filings away and into their own eyes. It was a worrying development, but luckily, someone managed to find an eyebath among all our gear, and permanent eye damage was narrowly avoided.

Having started with the hacksaw blade at about half-past eight in the morning, the task was finally completed and the assembly removed and stowed in the Land Rover by just after five in the evening. Meanwhile, I had made room for it by stowing kit from the Land Rover into the truck. It had finally been decided that Dave Beynon and Jim Hubbick, who were climbing friends of long standing, were the best people to be left behind on guard duty.

Destination Kabul

It was too late to be setting off into the night, so we had a meal and retired early. We were ready for an early start in the morning with the Land Rover after a long, hot and frustrating time yesterday. But we knew that removing the wheel was only the start of the real challenge. We needed to get the truck back on the road without undue delay. At dawn, we packed our own gear and relocated a tent for the guarding party at a prominent but sheltered location close to the truck. We then left them sufficient food and water for several days. Wishing them luck, we drove off towards Kabul into the rising sun. By 11 in the morning, we had arrived in Kabul, and Sam was already in deep discussion at the Land Rover Agents, which we had located relatively easily. Unsurprisingly, they were unable to help directly, as the truck was quite different in size and construction. More worryingly, they could not even suggest an alternative vehicle maintenance company who might be able to help.

Sam was not to be discouraged. He always had an alternative up his sleeve. Eventually, through the engineers of the national airline, Ariana, he managed to locate a proficient local engineering firm, Jangalak Industries. Finding their factory was not easy nor was explaining the problem when we located them. But we were immensely relieved to learn that they understood what we wanted and that they could do the job within a couple of days. Having left the entire wheel assembly with them, it would have been nice to take breath. However, some of the team was due from London via Teheran that very afternoon. Sam left us in town and went straight to the airport, where the plane from Teheran spiralled down between the mountains in a thunderstorm. Having made space for four or more in the Land Rover, he was disappointed to find that only one additional member of our team had arrived.

Pat Hurley, the expedition doctor, was welcome if only for his particular skills.

Pat Hurley

A main road in Kabul

He soon revealed that he had been unable to bring the maps for which we were hoping. Instead, he brought news that some of the original members of the team had decided against joining us. Moreover, others had been unavoidably delayed by paperwork for a further week. This situation would at least give us a chance to resolve the problem with the truck, but there were other crucial negotiations to be concluded. We had permission to be in the country, but Afghan ministries still had to grant us approval for travel into the mountains. This was to prove a protracted process.

Pat also brought us up-to-date news of events across the world. The fighting between India and Pakistan had still not been halted. Meanwhile, the situation in Vietnam had become more fraught and US troops were for the first time directly engaged in the war. For the next few days, we found ourselves stranded first in Hotel Spinzar, an odd-looking, Eastern-European–style skyscraper clad in tiles. Later, as negotiations continued, we moved to the elegantly classical, but decaying splendour of Hotel Kabul. This proved a cheaper option. Luckily, we soon located Khyber Restaurant which was more efficient and attractive than either hotel. We relieved our growing anxiety by spending one fascinating afternoon in the extraordinary National Museum of Afghanistan. We even used a spare evening to visit Park Cinema, where we were possibly the only viewers to understand the English soundtrack of Hitchcock's The Birds.

The waiting gave us plenty of time to familiarize ourselves with this most extraordinary capital. Istanbul and Teheran had been exotically oriental, but firmly anchored in the second half of the twentieth century. They were bustling cities dominated by terrifyingly aggressive drivers of modern motor vehicles. There, men, women and children rubbed shoulders on densely crowded pavements. Kabul, by comparison, was a sleepy town, with medieval overtones, at best left behind somewhere in the early twentieth century.

Women were rarely seen and were invariably hidden beneath burkas with tightly woven grids across their eyes. There were only a few motor vehicles. Many loads were carried

A market scene in Kabul

The British Embassy in Kabul

on donkeys, which brought fruits and vegetables to the markets. Heavy manual labour was still prominent. Huge loads were hauled around by men pulling handcarts. There were even men still carrying immense loads on their backs balanced only by straps across their foreheads. This did not feel like the 1960s.

The city, small in scale, stood on a plateau beside the Kabul River. Ancient walls clung to adjacent steep and rocky bare hillsides, a reminder of an illustrious history. However, there was no sign of the beautiful gardens described by the Mughal emperor, Babur.

The sparkling white Georgian-style British Embassy, when we found it, hidden in the suburbs, looked like something from a film set. Designed to impress, the embassy was a bizarre contrast to the dusty Afghan ministries. One had the feeling that it might impress British visitors and reassure them of British diplomacy, but was never going to impress the rugged Afghans. It was salutary

The road alongside the Panjshir

to remember the several dramatic failures of British intervention in Afghanistan over the previous 150 years. Nowhere else in the world had an entire, allegedly victorious, British Army been slaughtered. In January 1842, only a single, badly injured, survivor had escaped over the border into British India.

Slowly we worked our way through both the British and Afghan administrative nightmares. After some glitches, the axle assembly was also reconstructed and made ready to be taken back for fitting in the truck. Sam soon got organized with Derek to set off towards Kandahar to rescue Jim and Dave. However, it was simply not affordable for the rest of us to remain behind in expensive hotel rooms. So, we were driven to the Kandahar road where we found a suitable place to camp for a couple of days.

A local source of water was found in a stream bed and seemed sufficient for our immediate needs. We were also visited by the friendly local goatherds who offered us goats' milk. We accepted, confident that we now had our own resident doctor who had an abundance of medication at his disposal. Our presence was soon known and we had a friendly visit from the heavily bearded district administrator who warned us in broken English against staying long in such a dangerous place. As it turned out, the greatest danger was the sun, for all of us got quite badly sunburnt, forgetting that the UV at that altitude was intense in the clear sky. We were surrounded by distant snow-capped mountains. Nearby was a dry riverbed with many birds burrowing into the cliffs to nest and raise their young. Pat, a keen ornithologist, was in his element.

It was the end of the first week of July by the time we were sufficiently organized to set off north from Kabul towards the mountains and their glaciers. By now, the entire overland team and Pat had all been reunited and granted permission to travel. We had acquired an interpreter, Jan Mohammed, through a contact at Kabul University, and had also been provided with an army 'minder' to travel with us. The rest of the expedition team was not due for a couple of days and we would need to send back the Land Rover later to collect them.

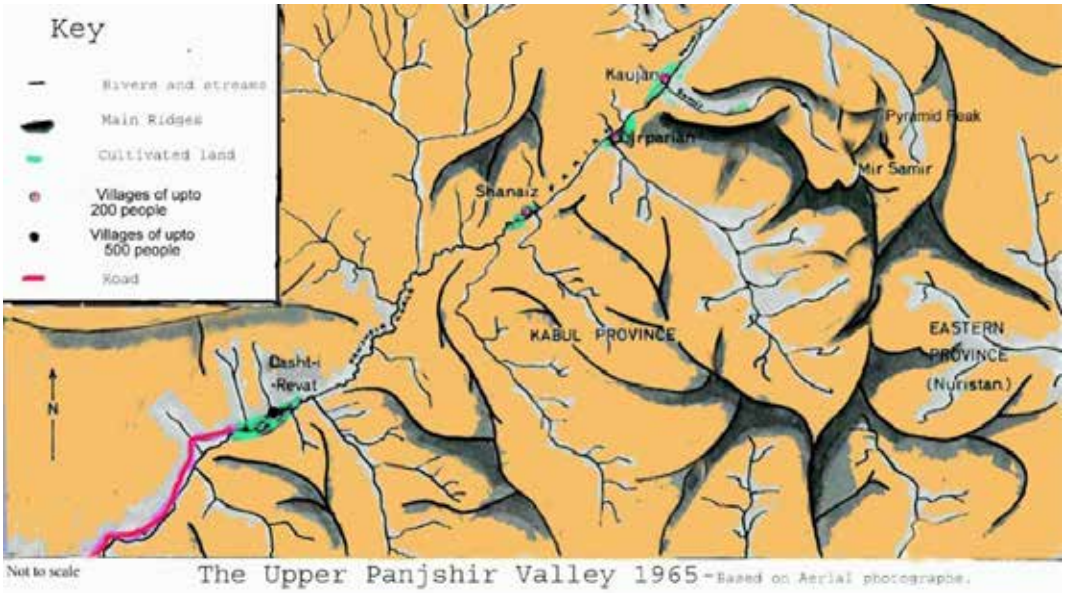
When we got underway and crossed the Shomali Plains towards Charikar, it was clear that the truck was labouring to keep up with the Land Rover. The major town of Charikar commanded the entrance to the Panjshir Valley which we needed to access in order to reach the mountains. A fort in this undistinguished, dusty town had once been the scene of the ignominious defeat of a detachment of the first British army of occupation. Back in 1842, only two British officers had managed to escape when the fort was abandoned. They eventually made their way to join the ultimately doomed force in Kabul.

Leaving Charikar, we began rising steeply towards the mountains through Gulbahar and into the mouth of the Panjshir Valley. We wound gradually uphill along narrow roads more suited to horses and camels than to heavy vehicles. It was in this remote

area that British women and officers were held hostage through the winter by the Afghans during the disastrous British retreat from Kabul in 1842. Looking at the scene around us, it was easy to relate to the words of Sir William Fraser-Tytler, once British ambassador to Afghanistan, who described "...a wild desolate country of great peaks and deep valleys, of precipitous gorges and rushing grey-green rivers; a barren, beautiful country of intense sunlight, clear sparkling air and wonderful colouring..." The next few days were to prove his description to be stunningly accurate.

As night fell, it became too dangerous for us to proceed further and we had to camp in a deep gorge alongside the fast-flowing Panjshir River. Being the most unwell in the party entitled me to the luxury of the back seat of the Land Rover for the night. We awoke on the morning of 8 July to a large explosion. One of the rear tyres of the truck had suffered a massive blowout and was torn to shreds. The increase in altitude and reduced air pressure had probably been a key factor. We were doubly lucky in that no one was injured and more crucially, that the truck was stationary at the time. Had it been negotiating the mountain roads, the consequences might well have been fatal. We took the explosion as a warning and rapidly adjusted each of the other tyre pressures.

By the time we had had breakfast and changed the wheel to replace the tyre, we learnt that our vehicles would be unable to get beyond the next village. Beyond that point the road had been completely washed out by the Panjshir's spring floods. Fortunately, there was good news to leaven the bad. Apparently, a Chevrolet bus had been stranded beyond the washout in the upper part of the valley. We might well be able to rely on hiring it to take us and all our gear to the furthest point along what remained of the road. In the meantime, there remained the task of transporting everything across the gap torn in the road by the flooded river.



An illustration of the Upper Panjshir put together from aerial photographs taken in the 1960s.

The journey along the Panjshir Valley

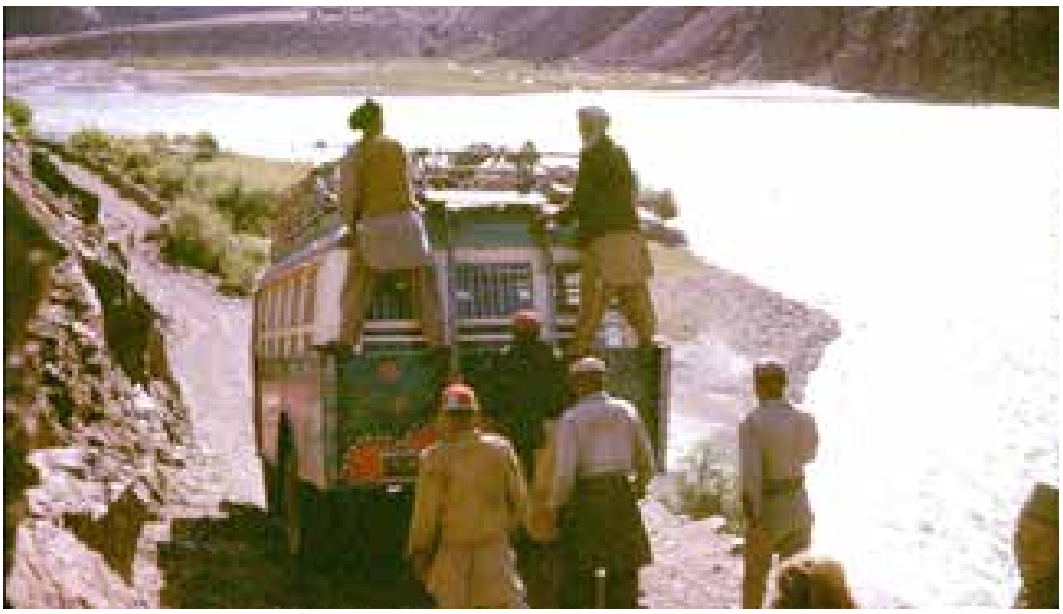
We were able to continue along the valley in our own vehicles only as far as the village of Sangona. There we began negotiations with the village headman, aided by his numerous and noisy advisers. We were reluctant to unload anything without a clear understanding of the next stage of our journey. Sam led the negotiations. Meanwhile, Dave and Pat set up open-air surgeries for dental and medical problems. Soon, they were surrounded. Women were notable by their total absence, but it was an immensely colourful scene. The men were exclusively dressed in the traditional salwar kameez rather than shirts and trousers. The majority wore pure white turbans carefully wrapped around embroidered skullcaps. Two were distinguished by their black turbans, which, we were told, identified them as direct descendants of the Prophet. It was a scene which in many respects would have not been out of place in the mid-nineteenth century.

The first priority for Sam was to make sure we could hire the bus beyond the washout. Then we had to hire enough horses and donkeys to carry all our gear on a tortuous mountain track around the section of the valley side that had been washed away. Finally, there was the mayhem of deciding on which horses or donkeys would carry what loads. It was evening before Pat and Dave completed their surgeries. Meanwhile, the transfer of our gear had been completed, the horseman paid off and we were securely settled beyond the gap in the road. After a shared evening meal, Sam and Jim made their way back to the Land Rover. They intended to return to Kabul in the morning to collect the rest of the party from the airport. Meanwhile, we were to proceed as far as we possibly could.

Loading horses in Sangona

I was still feeling seriously unwell that evening with acute gut-rot, and slept only fitfully in the Land Rover. The next day, we awoke early, knowing that we had a significant challenge awaiting us. I had been feeling dreadful and for the next 36 hours, my health deteriorated further, much to the alarm of Pat, our doctor. Thankfully, the Chevrolet bus arrived promptly and the loading progressed quite rapidly. We were careful to ensure that the most valuable items were kept within the bus rather than on the roof. We had the bus loaded and were on our way by around half-past nine in the morning.

The road clung to the precipitous mountainside and the driving style necessitated by the terrain only added to an already breathtaking, not to say terrifying, experience. It was not long before we began to envy the locals hanging on the outside rather than joining us inside. If the bus left the road, we might at some locations tumble hundreds of feet into the river. Those on the outside might just have a moment to jump clear before the full tragedy played out. While we avoided such a disaster, the day was not without dramatic incidents. At one point, we rounded a corner to find that a



The local bus trapped beyond the break in the road

landslip had blocked the road immediately ahead. The driver braked violently and we were all badly shaken.

We then had to wait for the landslip to be cleared enough, by men equipped only with shovels. Later, we came to a grinding halt when the back axle of the bus broke on the horrifically rocky road.

What we soon learnt from this experience was that Afghans are immensely resourceful. Instead of throwing up their hands in horror, they assured us they could fix it. This seemed an unlikely claim since the only substantial town lay miles behind us, beyond the washed-out section of road. Moreover, it appeared that there were no other vehicles, let alone a motor workshop or spares store, along the now-isolated section of the road on which we had been travelling. We now turned to our educated Afghan interpreter, Jan Mohammed. He was himself a Tajik and spoke Farsi, the language of the Panjshir Valley.

He confidently explained the situation in very simple but graphic terms. “The back axle is broken. This often happens but it will soon be mended. They are sending for the back axle from another bus in the village. Sometimes the buses in this region fall off the road, but not very often.” Our doubts about this analysis proved unjustified and Jan Mohammed turned out to be absolutely correct in his assessment of the situation. It was true that there were no other mobile vehicles around, but there was a broken-down vehicle in a nearby village. It was soon cannibalized to provide a replacement rear axle. Meanwhile, we were urged to go and drink chai in another village until the work was completed. It seemed to me, in my by now very confused and febrile state, that we were walking for ever. Eventually, we reached the village and were delighted to be served endless small bowls of hot milk-free green tea. It was immensely refreshing.

The bus on a narrow strip of road high above the Panjshir

Arranging loads in Dasht-i-Rewat

Drinking such bowls of green tea was to become a familiar ritual, easing along my later research work in the high-altitude villages of the Panjshir. By mid-afternoon, the bus had been revived and we had progressed to the end of the road at a village called Dasht-i-Rewat. It was a place with which I was to become particularly familiar in the weeks to come. It was an oasis of irrigated green fields on a limited area of flat land at the bottom of a deep gorge, whose sides seemed entirely devoid of any vegetation.

Soon the bus was unloaded and negotiations began for hiring the horses to take us on the remaining, much more demanding, part of the journey into the mountains. Hitherto, we had dealt with Afghans in traditional dress, the salwar kameez with turbans on their heads. It being a cold region, they also sported either jackets or waistcoats and many wore tough, locally made boots of ibex leather. In Dasht, we found someone quite different with whom to negotiate. Abdul Haq cut an impressive and unexpected figure. He spoke some English and wore a smart leather jacket, like a particularly fashion-conscious East End gangster, except that he often wore a smart grey karakul hat.

Abdul Haq

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In reality, his life shared other similarities with East End gangsters, for Abdul Haq apparently controlled all the smuggling back and forth along this remote part of the border with Pakistan. All of the horses in the area were regularly employed by him in his illegal trade, immune from government oversight. This was a double-edged sword as far as we were concerned. It meant that he could credibly produce the required number of horses overnight. However, it also meant that he was a tough negotiator on costs.

I had passed the day in a bewildered semi-conscious state. As soon as we arrived in Dasht, I had collapsed. Pat had then dosed me with the strongest medication he could muster. He had by now begun to fear that I was suffering from cholera, a disease still endemic in Afghanistan. I was

Setting off from Dasht-i-Rewat

put into isolation in the shade and left my sleeping bag only to attend to the evermore insistent calls of nature. The team, led by Marge, now in maternal mode, managed to ply me with fluids regularly into the night and everyone hoped for the best.

I later learnt that Pat was doubtful if I could survive the intensity of my fever and resulting dehydration for very much longer. He knew there was little more that even he could do to remedy the situation in the absence of a clinical drip. Luckily, I eventually fell into a deep sleep and when I awoke, to Pat's obvious relief, I was feeling slightly better. His suspicion that I might have contracted cholera later proved consistent with reports from the WHO of an outbreak when, weeks later, we returned to Kabul.

Despite all the promises and showmanship of Abdul Haq, few of the horses arrived early. Their owners, he explained, were still collecting them from the high pastures. Meanwhile, I tentatively ate a few chapatis. Pat and Dave, while waiting, set up a new surgery camp and were immediately surrounded. The reason became apparent fairly quickly from the range of untreated conditions with which they were faced. Jan Mohammed confirmed that no properly qualified doctors or dentists were ever seen this far up the valley. Abdul Haq took the opportunity of the delay to impress us with his shooting skills and told us of the ibex that could be hunted up in the surrounding mountains. His skills were genuinely impressive, as he demonstrated by hitting a matchstick at 10 metres!

It was almost 11 in the morning before all the horses had been assembled and, after several noisy disputes between different horsemen, the heavy loads of bulky tea chests had been distributed between them in an equitable manner.

Loading the horses was not easy and the saddles were used to anchor the bulky loads and felt blankets were strategically placed to limit the abrasion on the horses' flanks. An additional horse had been reserved for me to ride in the light of my state of debilitation and exhaustion. However, I had never ridden a horse in my life, so I was hesitant to try now. In any case, when we set off it was at less than walking pace, as the horses were so heavily laden. The extra horse was available for anyone to ride and eventually, Pat, who was an experienced horseman, mounted it. Later, I tried to ride for a short period, but on the rough ground found it difficult just to stay aloft. Marge then took over as she also had had some previous experience in riding.

A heavily laden pack horse

Our main guide, Mohammed Jan

It was not long before we began to climb steeply up the side of the gorge. The path was narrow and rough. There was often just space for one horse at a time and little room for any mistakes. Luckily, the horses were strong, tough, sure-footed and used to carrying heavy loads in this demanding environment. Progress each day seemed to be regulated by the three prescribed halts for prayer during the day. This was only possible at a small number of locations, where the horse train could assemble safely. Our pace of progress was measured to ensure that we arrived somewhere safe by the time of prayer. On this, the first day, we stopped at noon which was only one hour after we embarked on the trail.

Abdul Haq had entrusted us to his lead horseman, Mohammed Jan, who was to stay with us throughout our time in the valley. It was he who determined our pace and the places and times where we ought to halt. Upon arrival at the first prayer halt, each individual found a spot where he could pray facing Mecca. Then the sacred rituals began – every man knelt and bowed, touching his forehead on the earth while repeating his prayers. Many of the tribesmen fingered prayer beads all day, signifying their religious obligations. These breaks gave those of us on foot the chance to slowly move ahead of the horse train.

After the first of the prayer breaks, the horse train set off into a dramatically steep section of the gorge which those on foot, by now ahead, had already crossed. An exposed, bare yellow cliff had been badly eroded into a huge 45-degree scree slope feeding debris into the river far below. This mobile slope was crossed only by a track narrowly etched into its face. There was no room for two horses to pass. One slip or rock fall in this section and some of our carefully packed scientific equipment might be irretrievably lost. We watched from above, our hearts in our mouths, as the horses gingerly approached the crossing point.

Never have I seen a more dramatic sight than that of our caravan of heavily laden horses winding slowly and painfully up the Panjshir's precipitous gorge. It was, to put it in that overused Americanese, "awesome". It looked pretty terrifying to us, but to the locals it was part of their normal scene. They took it in their stride with the minimum of fuss. Not a single horse put a foot wrong. Within less than half an hour, we and the entire train of pack animals were across and making slow progress on

Negotiating the Panjshir Gorge

more stable but even steeper ground.

It was now very hot under the clear sky. Moreover, our exertions made us feel even hotter. Passing an abandoned village, we were told that it had been destroyed by a sudden landslide. It was easy to accept the explanation. After another hour on the trail, the tribesmen insisted on unloading their horses and giving them a brief opportunity to drink water and take advantage of the sparse grazing. We decided that it was not wise for us to halt and provide an excuse for a greater delay. Instead, we continued slowly along the trail, trying to help our bodies adapt to the increasingly thin air. Before long, we saw the trail of horses following in our wake.

On our route, we passed only a small number of other travellers on their way south to Charikar or Kabul. Some were from far-distant villages and looked markedly different in dress from our horsemen. We were soon to understand that the Panjshir is a corridor that gives access to numerous side valleys. Here, ancient cultures had survived for centuries undisturbed by the great sweep of history. One man we met was from the mythical province of Nuristan, accessed only by a narrow valley leading east from the Panjshir. The Nuristani people

Never have I seen a more dramatic sight than that of our caravan of heavily laden horses winding slowly and painfully up the Panjshir's precipitous gorge.

were not Muslim and in their remote valleys, they still preserved their animists beliefs. On another occasion, we came across two men herding diminutive cattle to the market in Charikar. We were also passed by a husband leading his wife on a donkey. She wore a bright blue, all-enveloping burka; only her hands and feet were visible.

An overnight halt

It was not until daylight began to fail that we sought somewhere to camp for the night. Every piece of flat land seemed to be intensively cultivated, so we faced a problem. Eventually, we drew to a halt beside a small island on the riverbank. It was clear that during the spring snowmelt, it had been under water, but by now, it was dry enough for us to safely stay the night. The tea chests and other loads were unloaded and stacked for overnight security. As darkness fell, clouds formed briefly in what had been a perfectly clear sky. Amazingly, a small squall of rain and a strong breeze beset us as we cooked our meal in the shelter of a large rock. It was the first rain we had seen since leaving Western Europe. It led us to erect tents overnight both for us and for the remaining horsemen; the majority of their companions had already left, taking all of the packhorses to the high pastures, where they could rest and graze overnight.

It was not long before the squall dissipated and the clouds dispersed. As they did so, the temperature plummeted, for we were by now above 7,000 feet. The sky was the clearest most of us had ever seen. The atmosphere was free from industrial pollution and we were also far away from any source of artificial light. The stars and planets seemed to crowd in upon us. It was on this evening that we saw, for the first time, an object in the sky that was to become a regular visitor.

An overnight halt

On first appearance, we assumed it to be a shooting star. With that thought, we headed for dreamland in a state of sheer exhaustion. Such was the regularity in terms of the time, speed and course of our supposed shooting star that over a few nights, we began to realize that it must be a man-made object. It slowly dawned upon us that the Soviet space programme was directed from Soviet Central Asia, which was immediately to the north of us. We were throughout our stay being given a grandstand view of some of the earliest man-made satellites to orbit the earth. Little did we know that they would eventually provide more evidence of glacial retreat than we could ever imagine.

On Sunday, 11 July 1965, we arose very early, ready for the horses to arrive and eager to load up and head off. However, they did not arrive from their overnight pasture until seven in the morning. Some of the horses had developed sores from their loads, and Derek did his best to patch them up and relieve their wounds with plasters and creams provided by Pat. Then suddenly, there arose a noisy dispute about the loads. Having been stacked overnight, the horseman could not agree on which loads they had carried the previous day. The dispute quickly became acrimonious and was threatening serious delay.

I was determined that nothing should be left behind. All of us had taken too much trouble to get it all this far. In the end, I went over determinedly and, picking up half a load, began to carry it away on my back. It was an effective strategy as it touched the chord of honour in these men, and so, several of them rushed up to me. The first one insistently removed my load and placed it on his horse. This was a great relief as I could not have staggered far with it in my state. The horse train was now successfully underway. I cannot recall any other occasion in my entire life when the application of a little basic psychology solved a potentially serious problem so rapidly

Exploring the Upper Panjshir and Samir

We slowly moved up past villages perched on crags. Flat land was at a premium and was reserved exclusively for cultivation. The Panjshir River constantly sped downstream on our right-hand side. The tracks everywhere were rocky and a challenge for the horses. Eventually, we stopped for lunch at a small village. We were greeted by the village headman and insistently seated beneath an apricot tree to enjoy the hospitality of his humble home. His family served us the by now familiar bowls of green tea and in appreciation we gave them cigarettes. One old man noticed the plasters we had put on the sores on the horses. In fact, they were merely insulating tape, but they did at least stop flies and other insects from burrowing into the raw, infected flesh to lay their eggs.

The old man had a cut on his finger and demanded equal treatment for his wound, a request with which we easily complied. While we had our lunch, all the horses had been unloaded and it took quite a while to get them all loaded again and underway. Meanwhile, we sat in the shade to escape the hot sun in the very dry high-altitude air. Eventually, we got underway, winding above the narrow cultivated valley bottom between the villages.

Occasionally, we could now, for the first time, glimpse distant snow-covered mountains along side valleys. Reaching a small village in the late afternoon, we crossed a precarious, but imaginatively constructed bridge across the Panjshir River. This was the first location we had

The bridge at Kaujan

Enjoying chai in a hospitable village

found in the entire valley where the terrain combined with the reduced size of the river to make bridging a viable option. It also made the village a valuable location. We found that it was called Kaujan and that the Samir Valley, our destination, was close by. The friendly villagers were Panjshiri Tajiks who followed the Shia traditions of Islam.

It seemed a particularly suitable place to rest for the night, if only we could find space. In this harsh landscape, every viable piece of flat land was being used to grow crops. There was a small area beside the river, but it offered too little space to put up all the tents, so we decided once again to sleep out under the stars beside the river. Once their loads were removed, both horses and horsemen disappeared to higher pastures for the night. Pat,

We were greeted by the village headman and insistently seated beneath an apricot tree to enjoy the hospitality of his humble home.

our doctor, who had been commissioned to undertake research on the effects of altitude, now took blood pressure and pulse readings of each of us.

Pat also held a hastily convened surgery for the locals. The major finding was the prevalence of tuberculosis, which spread so rapidly in these crowded households, especially when domestic animals and people lived under a single roof. There were other illnesses and injuries, some of long standing. Finding a man with a foreign body in his eye, Pat vainly tried to extract it; unfortunately, it had been there too long and his efforts came to nothing.

Kaujan village, perched above the Panjshir

The Samir Valley reconnoitre

Meanwhile, several of us went to examine the stream coming down the Samir Valley. It was initially disappointing to find that there was so little debris. This immediately gave rise to concerns that there might be no glacier above, as glacial streams usually carry large volumes of silt. We had certainly seen no evidence of a glacier so far and we needed early confirmation to ensure that our research could be carried out in this valley, as planned.

Close to the entrance to the Samir Valley, we were surprised to find a nomad encampment of thick felt tents, complete with camels resting beside the stream. It transpired that these nomads returned to this location every summer bringing their livestock to take advantage of the huge areas of high-altitude pasture emerging from beneath the snow higher up the valley. In autumn, as the snow returned, they would return with their flocks to the desert margins where they would live out the winter.

We were invited into their tents, surrounded by stone stockades, which could be approached over a small stone-built bridge. The people here were Pashtun nomads, speaking a language totally different from that of the local Tajiks. Their traditions were also quite different. The colourful costumes worn by the women and children, who did not hesitate to approach us, contrasted greatly with those of the settled Tajik people of the area. The Pashtun nomads, Hanafi Sunni Muslims, had no tradition of hiding away their women and they wore no burka.

The nomad encampment

The next morning, Monday, 12 July, I was feeling sufficiently well to join Derek and set out early before seven on a reconnaissance mission. In retrospect, it seems a substantial tribute to the resilience of youth, for only 48 hours before I had seemed close to death's door. Our prime aim in setting off before the main party was to establish that large-enough glaciers were to be found along the valley. Then we were to locate a suitable site for our base camp. The heavily laden horses and the rest of our party were to follow as soon as everything could be packed and loaded. For the first mile past the nomad encampment, we had no problem following a clear track. Then, in a rocky section, the track became less distinct and we found ourselves inexplicably on the wrong side of the main stream.

We eventually realized our mistake and decided to cross over to the other side. This was easier said than done. The stream was already too steep and far too deep for us to cross with our boots on, so we decided to take them off and wade across. The water was absolutely freezing and reached up to our thighs. We ran the risk of slipping or being injured. Luckily, we emerged unscathed but numbed by the icy water. On the other side, we quickly got into our boots again and began climbing higher. We were then amazed and mystified to find traces of tyre tracks on the dusty trail. They seemed

The summer camp of the villagers of Kaujan

This was no ordinary settlement, but a temporary summer home for those Tajik villagers entrusted with grazing animals on the extensive high pastures.

rather discontinuous, which increased our bemusement. It was only later in the day that the mystery was solved when we noticed that many local people had sandals with rough rubber soles made by cutting up old tyres.

As the track became steeper and more rock-strewn, it was scarcely recognizable at all. Eventually, our altimeter indicated that we were already at over 10,000 ft. We were, therefore, surprised to still observe small patches of cultivated barley. The crop appeared to be grown on all sufficiently flat land, even on sunny spots adjacent to snowdrifts, which seemed to survive the onset of summer wherever they lay in the shade. Not far beyond the barley fields, we came unexpectedly across a small settlement so well set within the landscape that it appeared to be a part of it. This was no ordinary settlement, but a temporary summer home for those Tajik villagers entrusted with grazing animals on the extensive high pastures, exposed by the rapid snowmelt in spring. While keeping the livestock safe from predators, they were also busy collecting bundles of fodder to be carried back down the mountain to Kaujan. This was an essential task in order to ensure that the animals were fed and were able to survive throughout the long, snowbound winters.

Leaving the settlement behind, we headed up higher, for we knew that any base camp would need to be above 12,000 feet at a minimum. The air was now noticeably thinner and we made only slow progress. Before long, however, we crested a large scree slope and made an encouraging discovery. Beyond this barrier, we found a shallow lake which had formed behind a rock dam formed by the scree across the valley. The lake lay within a broad meadow of high-latitude vegetation. The lake and surrounding meadow ensured that the debris from any glacier was being filtered out of the stream.

Within the next hour, we crossed two further scree barriers as we laboriously climbed higher. Behind each of them, we found a shallow lake, surrounded by a meadow built from the debris. The number of these meadows with their silt deposits

First view of Mir Samir

Chapati and chives from the village headman

The headman dismounted and unwrapped a cloth around his waist. From it appeared a number of newly baked chapatis.

fully explained the lack of debris in the stream lower down the valley. Finally, we crossed a rock barrier and saw for the first time, the dramatic sculpted peak of a huge mountain. This was the Mir Samir – literally the mountain that speaks in the evening. Its jagged pyramidal shape left no doubt that large glaciers had carved its peak. Our aim now was simply to find a suitable site for a base camp closer to the mountain.

The day was slipping away rather rapidly and we were very relieved when the village headman from Kaujan, accompanied by our interpreter, rode into view. They assured us that the rest of the party were now making their way up the valley. The headman dismounted and unwrapped a cloth around his waist. From it appeared a number of newly baked chapatis. Leaving them on the ground, he strolled across towards the edge of the lake and began to gather green vegetation. He returned, rolling it inside a chapati. He offered a piece to each of us and we began to eat. The vegetation turned out to be mild chives, rather than a type of grass. It was an early opportunity for me to learn that apparently uneducated people living in remote communities often have a fund of essential knowledge about their own environment not readily accessible to outsiders.

Our brief sandwich stop is recorded in a photo in which I had taken my boots off. This was a response to having very painful blisters, something I was to suffer from constantly in the weeks to come. Our confidence in reaching high altitude that day is recorded in the fact that we were carrying ice axes. After a brief halt, we headed further up the valley and eventually located an eminently suitable site for a base camp. My experience with the scouts was turning out to be valuable in assessing sites. Sadly, we still saw no sign of the rest of the party and decided to head down the valley to give them some encouragement.

It was with some alarm that on crossing a scree dam around four in the evening, we saw in the distance that they had already unloaded the packhorses on a lower meadow. The majority of the horses appeared to have already left to descend the valley before dark. By the time we eventually met up with the rest of the group, it was clear that the site they had chosen was not only far too low, it was also unsuitable in a number of other respects. There was too little flat land, the ground was unacceptably damp and setting up a latrine far enough to ensure no contamination of our water supply was going to be problematic. These were fundamental issues as far as I was concerned, as an experienced camp maker.

Even more worrying was the proximity of the valley side with the risk of rockslides which might wipe out the entire team. My assessment was that we simply could not

The initial unsuitable overnight halt in the Samir Valley

The tents needed to be erected and food first found and then prepared. I was particularly concerned to ensure that the boxes were stacked where they would remain dry.

stay in this location for any length of time and adequately support work on the glaciers far above. Derek and I remonstrated briefly, pointing out that we had wasted our time in reconnaissance as they had chosen not to follow us to the most suitable site. The rest of the team replied that the daylight was fast disappearing and the horsemen had insisted that this was as far as they could or would go. Despite our frustration, there was no point in arguing further as there was no possibility of moving without the horses. A moment of reflection suggested that the horsemen had opted to get somewhere more hospitable before nightfall and a serious drop in temperature.

There was now much that we needed to achieve before nightfall. The tents needed to be erected and food first found and then prepared. I was particularly concerned to ensure that the boxes were stacked where they would remain dry. I was also keen to ensure that none was opened unless absolutely necessary, as repacking would probably be a nightmare and they would eventually have to be moved to a higher altitude. Luckily, as the chief of logistics, my view prevailed without dissent.

Glacier hunt

Before Hal's arrival, we had determined to climb higher and try to find a viable route to the level at which we ought to find the glaciers. Getting up on that Tuesday morning was a new experience and one which would soon become very familiar. For the first time, we had slept in tents inside two sleeping bags to keep warm. Even the interpreter and policeman had joined us in the tents wrapped tightly in blankets. When we opened the tent door, a hard frost covered everything.

After hot porridge for breakfast, we agreed that Derek should hold the fort at the campsite. We then organized iron rations to take for the day. First, I led the rest of the party to our proposed site for a permanent base camp. It stood at 13,500 feet, was safe from both rockfalls and flooding, and had a commanding view. This stunning location gained general approval. We then split into two parties. Marge joined Dave and me in taking a route up a large, dark scree slope, or rock chute, on the right-hand side of the valley. Oliver was to lead Mick and our interpreter up an equally steep route to the left. It was very hard going.

The rock chute approach to Mir Samir

Often, we found ourselves squeezing between huge, dark maroon rocks or scrambling on jagged and unstable surfaces. These were still covered in snow or thick ice wherever the sun had not penetrated. We were constantly aware that we might dislodge rocks, either trapping ourselves or sending them onto those following in the rear. We also had to rest regularly as we were yet to adapt sufficiently to the thin air. I had a basic ex-army altimeter given to me by my father. It read the air pressure and translated it into altitude. By the time we halted for a late lunch, it showed that we were already above 15,000 feet. We expected to locate glaciers by 16,000 feet, but they remained beyond the horizon.

We were sensitive to the need to return safely to base within daylight hours, and the hour after lunch was our last chance to prove that the route would be useful. I was by now gasping for air and approaching my physical limit. Marge was almost as exhausted as I was. Dave gradually pulled away from us and eventually crested the ridge. Luckily, the view was what we all wanted. He headed down and told us that he had had a clear view of what was certainly a very large snowfield and probably heralded a large glacier. Our spirits were lifted by the news and the journey down now seemed relatively easy. By the time we got down to the base camp, I still had time to wash some clothes in the ice-cold water, one of the least pleasant of our domestic tasks, and hang them in the setting sun to dry. By then Derek, who had remained behind, served up a very welcome hot meal.

The other climbing group had found their route discouraging. It was, therefore, decided that Dave would lead a reconstituted climbing group on Wednesday

Our permanent base camp in the Samir Valley

morning to follow our route and try to press on to the actual glacier. The aim was to be able to report accurately to Hal who was expected to arrive sometime on Thursday. Dave and Derek were to climb and they were to take our local guide, Mohammed Jan, who claimed to know the best route. The deal was that he would guide them as long as we could lend him boots – and my boots fit him the best. I was to remain at the campsite for the day and prepare to be able to load up and move higher as soon as Sam, Hal and the horses arrived.

I was not unhappy to take off my boots for the day as they had been giving me severe blisters. Unaccountably, I had somehow been persuaded that a boot with a steel shank would be safer when rock climbing. This may have been true, but when walking, their inflexibility tended to shred the back of my ankles. Luckily, Mohammed Jan's feet were as tough as leather and he returned with no blisters at all. The day had been a success and we were in a good position to brief Hal properly on arrival.

Early on Thursday morning, fresh horses arrived and brought news that the rest of the party had spent the night in Kaujan and would arrive before lunch. We immediately loaded these horses and began the transfer of everything up to the new base camp

No home in the world could have had more stunning views and this was to be our home now for many weeks.

in the location that Derek and I had reconnoitred. The news was disappointing. Instead of four additional team members, only three had arrived, Hal and his technician, Alan, along with Jim Parry. By the time I returned with the horses for a second load, Hal, Sam, Alan and the rest of the party had arrived with more horses. Hal was scathing in his assessment of the situation and insisted that our move to a higher base camp was essential. Derek and I felt vindicated in our initial assessment of the situation.

By the end of the day, using all the horses that had accompanied the final group, we completed the establishment a new base camp. In the course of the day, I had shuttled three times between the two campsites. Everything had now been transferred and our permanent base camp had been set up. It proved an excellent location with access up to the mountain as well as down into the valley. No home in the world could have had more stunning views and this was to be our home now for many weeks.

Setting up home at the base camp

Central to the base camp was a large, green mess tent. Next to this tent was an orange bungalow tent used in the main to store our scientific equipment. However, it also served from time to time as accommodation for any visiting locals. The mess tent was the only one in which more than three people could hope to assemble. It was to be the main store for our provisions. It was also to be the place where we cooked and ate in bad weather. In summary, the mess tent needed the internal dimensions of a Tardis.

I got to work organizing the space to best effect, checking first that everything had arrived intact. The full storage boxes were put to use as furniture. At the far end of the tent, where if necessary a door flap could be opened for ventilation, two chests were arranged to form a base for cooking in poor weather. Down the middle, a row of tea chests provided a table. Along the sides, we perched on whatever smaller equipment boxes were available. As the weeks went by, the provisions were gradually removed from the boxes, but they still kept their function as furniture.

Eating outside in good weather

Around the mess tent, small two-man green and orange tents were clustered, where we would sleep and keep our personal gear. This was also where we were expected to write up our research findings. We had set ourselves up in a location close to a stream to provide our water supply, but remote from the scree slopes which, in the previous location, might have collapsed on top of us in this earthquake-prone land. An early task was to dig a latrine far enough from the stream to avoid contamination.

Marge kept us in order, as the chief quartermaster, but she had made it plain throughout our journey that she was not going to be typecast as the cook. The cooking and washing up were, therefore, amicably shared among the entire team. Luckily, I had been brought up to cook at home and had also lots of experience with the scouts in cooking under canvas. The diet was restricted largely to the dehydrated food items that we had brought with us, so there was no great demand for sophisticated culinary skills.

I do remember the occasional cookery competition where we tried to discover if our limited ingredients could produce something novel. Thus, we came up with such exotic variations as fried mash flavoured with Vesta Curry. When I ventured down into the valley conducting land-use research, I tried to bring fresh food back with me. On one notorious occasion towards the end of our time in the mountains, I brought fresh apricots. Finding almost no one in the camp, I decided to stew them rather than risk frost damage. Sadly, it was only later that I learnt that the sugar I had used for flavouring the apricots was by then in short supply. I made sure that everyone enjoyed the apricots before I revealed the implication. My suggestion, that everyone now adopt the Scottish habit of putting salt, rather than sugar, on their porridge, was not well received.

Starting work

Domestic arrangements were always secondary to the scientific work as far as Hal was concerned. Alan and I were detailed to unpack and begin to calibrate the micrometeorological equipment immediately after arrival. Hal was determined to examine the glacier without delay. He was the oldest member of the party, was not a mountaineer, had just arrived and had had no time to acclimatize; he had also been ill for several days and to cap it all, he was just recovering from a varicose vein operation. He had every reason to take a day to assess the situation and take breath, but that was not in his nature.

By the end of his first day, Hal had climbed to the glacier and had returned to the base camp, full of plans. We were soon to learn that what Hal expected of himself in terms of pain threshold, endurance, determination and sheer bloody-mindedness was just what he expected of everyone else. He had previously been involved in major expeditions in much more exposed and dangerous locations. During the British North Greenland Expedition, he had overwintered in isolation at North Ice. Resupply there had depended upon airdrops during which one aircraft had crash-landed in severe weather. This was an event which resulted in one of the most dramatic rescues in Arctic history.

Hal was a man for whom, in the field, the term "totally goal oriented" might just have been invented. He was very insistent that the research got underway without delay as he calculated that the expedition was already a week behind schedule and we also had the interpreter for only a limited period. A detailed pattern of work for the entire team for the next few days was discussed as we ate and eventually was agreed upon as we huddled after dark in the mess tent.

Jim Hubbick and Olly Gilbert setting up meteorological instruments

In the meantime, it had been agreed that Jim Parry and Mick would need to leave us soon and travel back down the valley to pick up the Land Rover. Jim's geophysical work was reliant upon being able to take rock-core samples from the plateau of the Deccan in southern Pakistan. This was an area far away from any conflict and their trip was eminently possible, at least in theory. The samples were crucial

Dave Beynon pulling a rotten tooth

The summer home of the shepherds

Dave was welcomed warmly and he provided some dental treatment, while I began to learn about the types of livestock and the importance of transhumance in maximizing the food supplies for Kaujan.

as the geomagnetic orientation of the samples from this region might be central to providing evidence for the new plate theory of continental drift when compared with the samples taken on our journey. They conducted some preparatory research at the base camp over the next few days prior to departure. I was not glad to see Mick departing as it would mean I alone would be left to the tender mercies of Hal and his high expectations of an assistant glaciologist.

On Saturday, 17 July, after only two nights at the base camp, I was therefore relieved when Dave and I packed up our two-man tent and headed back down the valley. Dave was not a morning person, so getting organized took longer than I expected. Our aim was to make progress on two important research projects, where our interpreter would be essential. Dave was to offer dental care while concurrently examining the patterns of molar teeth to establish the level of ethnic diversity in the area. My role was to conduct a land-use survey and to gain a proper understanding of the agricultural landscape and farming practices through the year. Travelling alongside us were Mohammed Jan, our local guide, whose horse carried our tent and gear, and Jan Mohammed, our interpreter.

It was a long and rugged descent from 13,500 feet to Kaujan at 9,000 feet. We were doubtful that it could be accomplished sensibly or fully in one day. The path was rocky and steep. This also made it dangerous for the horse, which on more than one occasion had to be persuaded to continue down the route. The first place that we halted was at Sanjanak, the temporary summer settlement of the permanent Tajik population of the village of Kaujan. Here, we were treated to hot tea and chapati. Dave was welcomed warmly and he provided some dental treatment, while I began to learn about the types of livestock and the importance of transhumance in maximizing the food supplies for Kaujan.

The nomadic Pathans

It was mid-afternoon by the time we could resume our descent. The next stop was below 10,000 feet at the Pashtun nomad encampment. Here, our interpreter, a Farsi speaker, was less confident, being unfamiliar with the culture, let alone the language. However, we were made to feel so welcome that we soon decided to set up camp and stay for the night. Our modern tent stood next to woollen tents of a timeless design, surrounded by stone walls.

Dave was having a busy time and some interesting results were emerging from his dental examinations. The peoples of Hindu Kush were known to be ethnically diverse, for it had long been both a barrier and a meeting point between different cultural groups. The Tajiks in the village and the nomadic Pathans were only part of a particularly rich ethnic pattern. My research led me to become absolutely fascinated by the complexities of the nomadic way of life. I soon began to appreciate that it was far from a primitive way of life, but rather a remarkably sophisticated adaptation to a particularly hostile environment. The Pashtuns were not permanent residents, but merely regular summer guests in this area.

For most of the year, they lived much further south, roaming beyond the mountain ranges, on the desert margins. They were, however, welcome guests in the summer, as each year they brought trade goods with them into this remote and otherwise isolated region. Their main aim was to bring their flocks of sheep and goats to graze on the huge expanses of high-level pasture that were available on the mountain slopes after the spring snowmelt. This was not land which they contested with the locals, for the long winter severely limited the number of livestock the Tajiks could keep and feed.

A camel resting beside the Samir

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Livestock was the key to the livelihood of the nomads. The sheep that they kept were specially bred fat-tailed varieties, able to walk huge distances and survive this unusual pattern of life. During the summer months, in the endless high pastures, they put on weight, storing fat in their enlarged rear quarters. It was this stored fat that enabled them to travel back to the plains and live through the cold winters on the sparse vegetation of the desert margins. A small number of camels, the beasts

of burden of the nomads, could easily carry their tents and household goods over long distances. For the Pashtuns, the slow pace of life in the summer was pure luxury, with endless water and food immediately available.

Their encampment took up a limited area in the Samir Valley, beyond the edge of the cultivated land in Kaujan. There was just enough room to erect a small number of black felt tents, each surrounded by stone stockades. The hobbled camels lay nearby and two or three small cows and a few goats stood around. The women's hands were all white, for they were in the middle of making cheese and yoghurt. The majority of their large flocks of sheep and goats were supervised by the young men, several thousand feet higher up the valley, where rich green pastures were plentiful. These young shepherds led a hard life high in the mountains facing very cold night temperatures and the ever-present danger of the flock being attacked by the elusive snow leopard or even by wolves.

The curiosity that we had about these extremely friendly people was entirely reciprocated. European visitors were obviously very rare in such a remote valley. The women and children, in colourful, traditional costumes, clustered shyly around the small walled compound where we were seated. The women wore red woollen cloaks embroidered with designs in blue, and on their faces, which were not covered, had similar blue decorations. Around their heads they wore heavy black cowls rather than the all-enveloping burkas. The smallest of the children wore warm, tight-fitting, beaded bonnets; they too were equally curious. And these nomadic Pashtuns were extremely generous – they offered us, from their limited resources, first hot tea followed by fresh bread, butter and milk

Pashtun women

The curiosity that we had about these extremely friendly people was entirely reciprocated. European visitors were obviously very rare in such a remote valley.

Research in Kaujan

The next morning, I cooked breakfast, while Dave slowly roused himself. We then packed and made our way down to Kaujan to set up camp on the east bank of the Panjshir. We had an excellent view across the river to the village, perched on a high, rocky outcrop. No sooner had we got our camp established than an unexpected traveller crossed the bridge and strode into our camp – an Englishman, even younger than me, Nick Downey. He was accompanied by four porters, carrying his provisions. He had been inspired, no doubt at his Public School, by the explorer Wilfred Thesiger, and aimed to travel into the remote province of Nuristan. He had limited language skills and seemed to be relying, for his personal protection, on a walking stick that concealed a trigger which would be able to deploy a lethal rapier. After taking a single cup of tea, he disappeared into the mountains, his sangfroid making our adventure look like a picnic.

Kaujan village built on a rocky outcrop

As ever, we were made to feel exceedingly welcome by Tajiks of Kaujan who were amazing in their hospitality. On one occasion, we were invited to join a group of men who were sitting cross-legged inside a house and eating from a communal bowl of lamb stew, accompanied by chapatis. Of the women we saw barely a glimpse and that too fully covered by a burka. Over the next 48 hours, Dave and I conducted intensive research – he on dental issues and me on land-use patterns in the village of Kaujan. Throughout, we made full use of the knowledge of the local people using the skills of our Afghan interpreter.

With Mohammed Jan and the village headman on a rooftop

I was introduced once again to the village headman who had served such a welcome lunch to us on the high pastures. With the aid of our interpreter, I made an early start on my own research, of land use around the village. Later, I visited neighbouring villages and hamlets for comparison, all lying above 7,000 feet. It was a project that I continued, when free from other commitments, over several weeks. Sometimes, I stayed overnight either on a flat roof or lower down among the mulberry trees within a walled garden. This journeying among the villagers was an experience denied to my colleagues, each busy with their own research at high altitude.

The shared village plough

Carrying fodder across the Panjshir to Kaujan

Sitting cross-legged, I would discourse with bearded and beturbaned village elders. Even though my questions would have betrayed deplorable ignorance, everyone remained courteous and indulgent. Sometimes, I would be asked to join them for a meal. All would eat from a communal bowl dipping chapatis in it with the right hand only. Never did I feel threatened or ridiculed. Nor, despite my ignorance of their religious observances, was I treated other than as an honoured guest. Their hospitality and patience was a humbling privilege that I have never forgotten.

In Kaujan, the headman first outlined the activities that were carried out in a farming year. Then he brought out for display the limited agricultural implements available to the villagers. Metal was precious and had to be bought from as far away as Charikar on the edge of the plains where the plateau met the mountains. There, scrap steel from the springs of old vehicles was melted in forges and crafted into sickles and hoes. Most valuable of all was the bulky metal tip for the communal plough which was drawn by two of the diminutive cattle of the village.

While Dave checked teeth and made extractions under the shelter of a tree, I strode up the valley to the very limit of the fields of the village, making a record of its irrigation channels, its fields, crops and the trees planted judiciously around the village. I have written in more detail about my findings elsewhere, but a brief summary is useful in outlining the considerable challenges to ensure survival in this testing environment.

The small houses making up the village clung to the crag high above the river where the land could not be cultivated. Each house was home not only to a family, but also to their valuable livestock. In the extreme cold of winter, no livestock could possibly survive outside. To keep cows, sheep or goats alive through the winter, the people had to keep collecting fodder from the mountainside throughout the summer. All this fodder had to be carefully stored on flat roofs to be accessible when needed amid the heavy snowfalls of winter. It was impossible to house animals as big as horses through the winter as they would be a huge liability. Any horse owned by a villager had to be pastured somewhere less harsh in the winter. Life was so hard it was difficult to imagine.

On the third day, Jim Parry and Mick were due to travel down from the base camp to join us for the night before descending further and taking our interpreter back to Kabul. From there, they were to head off to conduct research into the emerging theory of continental drift, or what later became plate tectonics. They aimed to take core drillings of base rocks both from the Eurasian and Indian plates. This had been a key aspect of the original expedition plans, but it required them to reach as far as the Deccan of Gujrat in Pakistan. Their travel plans were now rather more fluid than they were originally, but they were intent on trying to get over the border into Pakistan. It was late afternoon when they joined us.

Return to the base camp

We were surprised to find that Marge had travelled down with them. What alarmed us was that she had no overnight gear and was apparently expected back at the base camp that very night. We now had an immediate and tricky decision to take. It would have been possible for Marge to simply stay overnight. We could crowd into tents using single rather than double sleeping bags. However, there was concern that the team at the base camp might decide to organize search parties. If Marge did not return soon after nightfall, they might fear she had been injured.


The view back along the Samir Valley

It seemed, from what was said, that she expected to return alone, but we felt that we could not let her attempt the journey alone so late in the day. There was really no possibility of anyone now reaching the base camp before dark. It was certainly no time of the day to set off with a horse, as it could not be led over screes in the darkness. Moreover, Dave had so much dental gear that he would need a horse to carry it all. By comparison, I could travel light. The best alternative then was my returning with Marge carrying my gear and the smallest of the tents on my packframe.

Wishing Jim Parry and Mick good luck on their trip to Pakistan, Marge and I set off up the trail. At first, we made very good progress as we were both very fit and by now knew the best route. We were over the lowest of the scree dams and onto the first of the meadows by nightfall, which was quite an achievement. There were, however, three more major screes to cross before reaching the base camp. Unlike Marge, I had adapted to the air pressure of over 3,000 feet lower than the base camp and so began to tire. Although we both had reliable torches, crossing screes at night is not to be recommended under any circumstance. It was not long before I slightly pulled a thigh muscle, which slowed us down considerably.

By the time we reached the site of our original – unsatisfactory – base camp, my load had become unmanageable. Marge now suggested that we camp there for the night. Though I had a tent and two sleeping bags, I was not personally comfortable with the option of camping there. Apart from everything else, it made little sense, given the reason we had set off in the first place. As a compromise, I left the tent and much of my gear under a rock. Having done this, we struggled on into the night. Even on the last scree there was, to my surprise, no sign of a search party. None had apparently ever been organized. It was ten in the night and very cold by the time we reached the base camp.

Our arrival seemed to be a surprise for those in the mess tent. It appeared that they had not been expecting Marge to return that night after all. I was totally exhausted, cold and baffled by what had happened. Pat, our doctor, as usual, took our pulse and blood pressure at rest. He was so alarmed that he advised me to see a heart specialist upon our return to the UK. This did not allow me to enjoy a good night's sleep.

The events of the day seemed destined to confirm Hal's prejudices against allowing women on expeditions. The next morning, I was allowed a comparative rest day. After breakfast, I descended to retrieve the tent and bag from under the rock. I then caught up on much-needed sleep for a couple of hours. The rest of the day was spent on research notes and housekeeping, including catching up on washing my clothes. By late that afternoon, concern had grown about Dave, who had been expected shortly after lunch. But with not a care in the world, he arrived from Kaujan just before sunset.

Glacier camp

In the subsequent days, the research programme on the glacier gathered pace. During my time in Kaujan, the rest of the team had gradually acclimatized themselves and a regular route to the glacier had been established, with cairns marking the path. A trip that had initially taken four hours to pioneer could now be completed, in good weather, within an hour and a half. Initial research work had already begun despite the failure of our generator. Now the work gathered pace, with Hal in his element, leading and directing the operations. To start off with, we climbed as teams on a daily basis to the glacier and in this way we were able to carry out research near its snout.

However, there was also work to be done at the heart of the glacier and a need to examine the ice down the bergschrund at the head of the glacier. What was now required was the establishment of a high-altitude camp on the edge of the glacier itself. On Saturday, 24 July, Sam, Jim Hubbick, Hal and I had an early breakfast before packing our tents, personal gear, food and enough fuel to cook for several days at high altitude. Dave assisted with the porterage even though he aimed to return to the base camp by nightfall. Despite our substantial loads, we arrived within two hours at the terminal moraine.

Our first glacier camp

We calculated that we were now at around 16,000 feet. Our high-altitude wear would be regarded as laughable today. I wore climbing breeches and long socks. A vest, shirt and pullover were topped only by a basic anorak. Scarves and gloves had none of the protective qualities of those I now wear while walking in the Dales. While I made a meal for everyone, Sam and Jim set about organizing a campsite. Hal was keen to make an early exploration of the nearest section of the bergschrund while the weather remained advantageous. This was a tall order in what was left of the day, but Dave agreed to assist. First, we daubed on UV-filter cream and adjusted our goggles. Avoiding both sunburn and snow blindness, from the intense reflected light, was accorded high priority.

We roped up against the risk of falling into the crevasses before making our way up the side of the glacier by laboriously cutting steps in the ice with our ice axes. As we got higher, the ice gave way to soft snow and we began to sink in it up to our knees. We made very slow progress. The last 20 yards of the approach took more than 20 minutes. On reaching the gap between the ice and rock, Hal and Dave belayed me as I began to climb down into the bergschrund. It was an extraordinary experience and not one I would recommend to anyone who suffers from claustrophobia.

Behind my back lay a smoothly eroded rock surface, a tribute to the grinding power of rotating ice. As I slipped slowly down the rock, the ice was only a foot in front of me. It was an eerie blue-green with rocks and

The bergschrund above the glacier

Derek Jamieson checking hydrological instruments

gravel embedded within it. The ice layers were well concealed by drifted snow and debris. Gradually, I was allowed to slide deeper into the bergschrund. Strangely, I was so preoccupied with my task that I had no time to be afraid.

Hal was calling impatiently for data, but I was not immediately able to provide the readings that he required, so he decided that he needed to follow me. This outcome had fortunately been anticipated and Dave had carried the lid from a tea chest for just this eventuality. The lid was now attached to our main rope and buried deep in the snow. It acted as a dead man to anchor Dave as he belayed both of us as we climbed down inside the bergschrund. Eventually, using our ice axes, we managed to clear enough of the snow and reveal enough ice layers to satisfy Hal that he had recorded useful data on the recent historical climate of the glacier. Then, once out of the bergschrund and relying on our ice axes as a brake, we were able to glissade back to our high-altitude camp by five in the evening. Here Dave had a bite to eat from our biscuit store, before heading down alone to the base camp. He seemed confident of reaching it within the last 15 minutes after sunset, in the little light remaining for him. Meanwhile, we began to get organized for the night.

Sam and Jim Hubbick had been checking out the hydrological equipment installed by Derek to measure the meltwater. By the time of our return, however, they had also erected tents on a flat shelf of ice and snow between the glacier snout and the terminal moraine. Moreover, they had found a large, flat rock nearby which could be used initially as a base for the Primus cooker and later as a table or a bench. It was very cold and our clothing was extremely basic by today's standards. A hot meal and a hot drink were most welcome. Before seeking the tunnel entrances to the tents, a radio call to the base camp was scheduled. This would ensure us information about whether Dave had made a safe return. Jim and I climbed to a prominent position with a direct line of sight to the base camp and stood for almost half an hour trying to make contact, but with no success whatsoever. Luckily, there was no wind, rain or snow. Nonetheless, by the time we got into the tents, we were still half frozen.

When we got back to the camp, Hal and Sam had both retired inside the tents and were wrapped in their sleeping bags against

Breakfast at the glacier camp

It was amazing how much snow was needed to make just a cupful of water. There were other surprises. We opened a sealed tin of coffee. At the low atmospheric pressure, the coffee exploded out of the tin as it was opened.

the cold. I joined Hal in our tent and, taking off my anorak, replaced it with a kid flying jacket that my father had given me. Keeping on almost all the rest of my clothes, I was very rapidly buried inside my two sleeping bags. While I was intent simply on wrapping myself up as tightly as possible, Hal nonchalantly spent the evening reading by the torchlight. The tents were tough and light, but had no flysheet or double skin. They offered good protection from all but the most severe weather and provided negligible protection against the very low temperatures. It was not long before the moisture in our breath began to form an ice layer on the inside of the tent.

Overnight, the temperature fell rapidly and one began to appreciate the intensity and effectiveness of freeze-thaw action. I tried to sleep as best I could, but was constantly awakened by rocks splitting loudly on the ridges above. In the silence, the sound was as penetrating as gunfire. Occasionally, a rock would split from a rock face and could be heard tumbling down the mountain. Fortunately, we had chosen a campsite far away from the rock faces and it was most unlikely that any falling rock would come our way. After a fitful night, dawn, which promised a slow rise in temperature, was very welcome.

When I attempted to get up, I found that I had missed a crucial piece of advice. My boots were frozen and I could not get my feet into them. Apparently, one was supposed to keep them wrapped in the outer sleeping bag. I now took them into my warm bag and gradually moulded them to the shape of my feet. The minimum temperature recorded overnight had been -31 degrees C. We had stored Vita-Weat biscuits in a tin for our breakfast. When we opened the tin, the biscuits were damp from the condensation of the moisture in the air inside the tin. To make some porridge, we lit the Primus and slowly melted snow. It was amazing how much snow was needed to make just a cupful of water. There were other surprises. We opened a sealed tin of coffee. At the low atmospheric pressure, the coffee exploded out of the tin as it was opened.

By quarter-past eight, we had already begun the work for the day. The first job was to dig a pit into the snout of the glacier so that we could examine the ice strata. From the density of ice, Hal hoped to learn something about the past climate. This was a technique he had pioneered earlier in both North Greenland and Antarctica. Once the pit was dug, Sam and I left Jim Hubbick with Hal as we had to begin the stratigraphic analysis and roped up to ascend the glacier. There were stunning views to admire as, breathlessly, we struggled up the steep glacier slope.

There was one immediate source of encouragement. We saw no sign of danger from any crevasses. Nonetheless, we roped up and tried to walk some yards apart to reduce the risks. Gradually, the threat of a trial by prusiking began to greatly recede. We walked for well over half a mile across the glacier, climbing over 200 feet in the process. Then we chose a random spot to dig a pit. We took turns in digging it about a metre square. This was necessary so that there was room for us to continue digging from inside it.

It was not an easy task; we were trying to penetrate successive layers of hard ice and compacted snow rather than continuous soft snow. Each ice layer represented the snow deposited in an earlier year. We were involved in the equivalent of a tree-ring analysis. As we went deeper, we were reaching layers deposited in previous centuries. It was slow work and, despite wearing gloves, my hands began to blister. The cold temperatures and dry air made our skin particularly taut and brittle. At one point, we almost gave up when we encountered a 3-cm–thick ice lens. This must have represented a period of particularly intense snowmelt and freezing.

Once this was penetrated, we managed to carry on, eventually achieving a depth of over seven feet. This, we thought, should provide sufficient data even to satisfy Hal. Our task accomplished, we took a cigarette break and sat on our haunches admiring the utterly spectacular panoramic view. We could soon see Hal struggling slowly up the glacier, merely a dot in the immense landscape of rock and ice.

When Hal arrived, we helped him to identify the levels and record them, as he carefully weighed each sample of ice down the entire depth of the pit. The method was to push an open-ended aluminium cylinder into the side of the pit. After recording the layers within it, the cylinder would then be extracted and its contents carefully weighed. With a known volume for the cylinder, the density of the ice could easily be calculated when the research would eventually be written up. Here on

Starting to dig a pit in the glacier

The glacier pit gets deeper

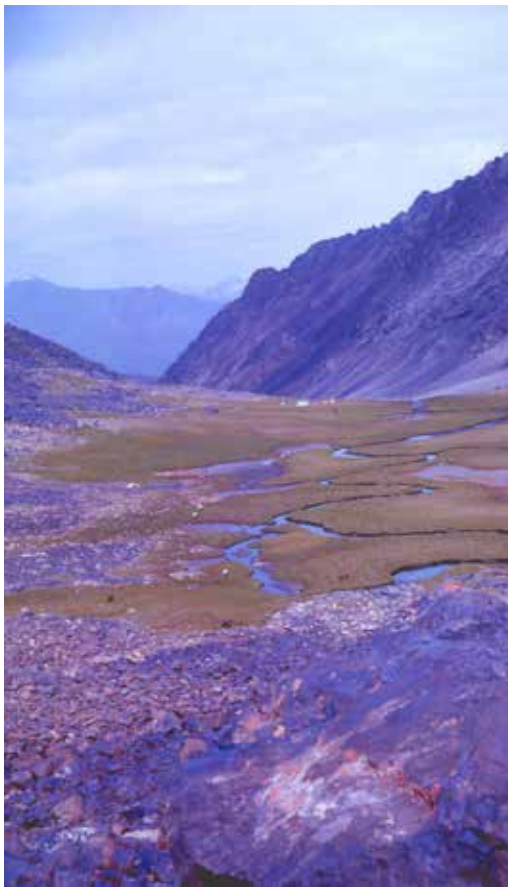
Measuring the ice layers in a glacier pit

The lonely journey across the glacier

the glacier the aim was to record the data as rapidly as possible, while the weather held. Sam stayed back till he could complete the records.

My task accomplished, I was dispatched back to our glacier camp to prepare a late lunch for the entire team. The descent was much easier than the ascent. While we ate lunch, Hal mused on the reliability of the data and stated that his aim ought to be to circumnavigate the entire mountain and record the ice strata on each of its several glaciers. Luckily, I did not have to challenge Hal on this proposal. Sam had the happy knack of chuckling and not taking the more extreme of Hal's suggestions seriously. As the senior climbing member of the team, Sam could, in any event, outrank Hal on the practicalities of the climbing and logistics, if not on the science.

Sam did not seek to confront Hal or contradict his analysis. He simply decided that our best plan for the moment was to return to the base camp that night and then consider all options. While we were having lunch, Derek appeared over the horizon to check measurements on the volume of water flowing from the glacier snout. Sadly, he found that his initial research had been ruined as the stream had changed its course. Soon afterwards, Oliver, who had been exploring possible climbing routes, also appeared. He claimed to have found a viable route over the steep arête separating



A view back to our base camp

our glacier from a glacier on the north-west flank of the mountain. This seemed to give Hal's proposal some encouragement at least until Sam put a damper on things by asking Olly about the level of difficulty of the climbing.

We packed up the camp and carefully left the tents and equipment in a secure location ready for our return once we had the micrometeorological equipment operational. The journey back to the base camp was more laborious than we had anticipated. In the good weather, much of the snow, which we had been able to glissade rapidly down in the past, had now melted. Instead, we were reduced to finding a new, safe route through the scree which had emerged from the melting snow. There was some disappointment back at the base camp when we discovered that it was a Sunday, for earlier we had all somehow persuaded ourselves that it was a Saturday.

Beyond routine

There was a treat when we arrived at the base camp. Among the provisions donated to the expedition were some huge slabs of Peek Freans fruit cake. When packing had become problematic, several people had suggested leaving them behind in Newcastle. However, I had persevered and secreted all of them in the packing cases, amid the other provisions. One had now been discovered and was the cause of some excitement. We were all served a large piece with a cuppa, using our safe return as a good excuse.

From time to time, we were visited by the local people. These included some harrowing visits from the sick. Old men would bring in sick children. On one occasion, an ancient old lady had been carried piggyback up to 13,500 feet. There was often little that could be done for these patients since their illness had already progressed too far. Pat would dispense palliatives and would be showered with overgenerous gifts which could not be refused. Such gifts afforded us some welcome variety in our diet, including on one occasion roast chicken and, on another, omelette. Dave was less regularly in demand. We put this down to the local stoical acceptance of toothache as an inevitable feature of life. Dave's dental examinations had revealed that by middle age, most of the local people's teeth were worn down to the nerves by the constant grind of the millstone, a residual part of every chapati they ate.

Some of our visitors were merely inquisitive shepherds relieving the boredom of their isolated lives among the mountain pastures. Others were passing while collecting fodder for the animals for the winter. Less frequent visitors were the hunters, some sporting nineteenth-century Lee-Enfields, no doubt handed down from ancestors who took them from the British Tommies vanquished

Pat Hurley treating a patient

Afghan hunters passing our base camp

in the various disastrous Afghan wars of that century. Their quarry now was the elusive ibex which roamed at will across the mountain ranges. But the most we actually saw the hunters return with were ptarmigan chicks, which seemed to be valued pets, held in small cages in the local villages.

While we had been on the glacier, Marge had been helping Derek to maintain his research at the base camp. They were recording river levels and velocity on a 24-hour cycle. The good weather and rapid snowmelt was providing some quite dramatic data. Unfortunately, on one of his trips to examine the data, at the dead of night, Derek tripped. As a result, he almost lost one of our essential Tilley lamps into the river. To steady himself, he grabbed the stilling well that was continuously recording the river level. Luckily ,it held fast. He reflected that had it collapsed completely, his research would have quite literally "gone down the Suwannee" or at least down the Samir!

Research in the field is rarely straightforward and not all problems are easily resolvable, especially when you are in remote locations. Part of Hal's research involved using electrical equipment reliant upon battery power. The battery then relied on a generator for recharging. The aim of the project was to use thermocouples to measure at different heights the heat and moisture flow from the surface of the ground and, more particularly, from the surface of the glacier. But as Sod's Law would have it, it was not the electrical equipment or even the battery that failed, but the generator. This was our single largest piece of equipment.

Hal Lister trying to read scientific instruments

Return to Dasht

The failure of the generator meant that it had to be taken by Jim Parry and Mick to Charikar, or perhaps even to Kabul, to be repaired. Without it, collecting continuous meteorological data was impossible. Jim had undertaken to take it to Dasht and now it needed to be retrieved. The obvious person for the task was Alan, Hal's technician. However, Hal decided that it would be useful if I too went with him. His explanation was that it would enable me to do some more varied land-use research while also being a backup for Alan. As it turned out, it was a great experience and I am sure that Alan would have been much less confident of interaction with the locals if I had not been alongside him.

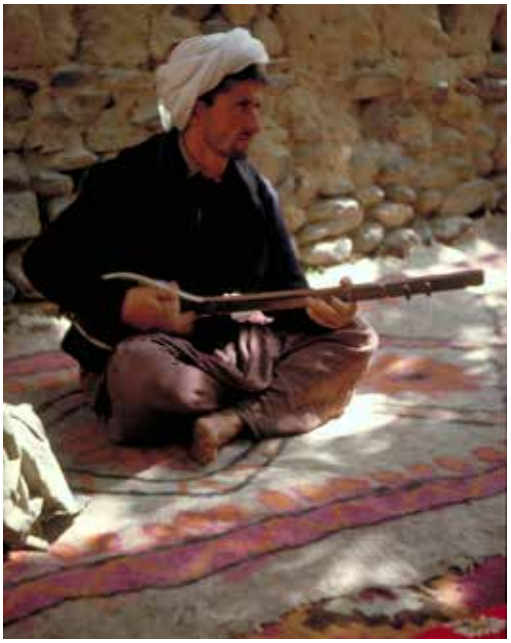
My previous time in the villages had allowed me to master some basic Farsi, which was very useful, as we no longer had an interpreter with us. By now, I also had a pretty good understanding of the rural economy and its expression in the landscape. I could, therefore, make the journey more interesting for myself and also for Alan.

We left the base camp, accompanied by Mohammed Jan, our local guide, on Thursday, 29 July, and descended once more towards Kaujan. Mohammed's small, grey horse carried our tent and kit. In Kaujan, both Mohammed Jan and I were by now well known and the headman insisted that we stay overnight on the flat roof of his house, rather than in our own tent. This was a considerable honour, as we were also expected, as his guests, to join him to eat mutton stew with chapati.

The roof was accessible by a ladder and already fodder was being accumulated there for the winter. In another area, the dung of cow and sheep was also being piled, ready to be used as fuel in the winter. Here, nothing could be wasted. This reflected the nature of what was a marginal, subsistence community. By now, I had learnt the amazing story of the flat roof itself. In a region bereft of woodland, every tree had to be planted and cultivated with care. Only when mature would a tree be felled to provide the roof beams of a house.

Alan Pendlington on a rooftop in Kaujan

Mohammed Jan and his hesitant horse descend the Samir Valley



Mohammed Jan playing his dutar

The view back to the green field of Dasht-i-Rewat, while descending the Panjshir Gorge

To add to the sense of occasion, we were entertained, before eating a delicious meal, by a man singing and accompanying himself on the dutar, a kind of two-stringed mandolin. Other young men took part in a rather energetic but regular bouncing style of dance, involving complex movements of hands and arms. Meanwhile, older men clapped or clicked their fingers percussively. During this impressive overnight stop, however, we did not set eyes on any women at all, not even one covered completely in a burka.

The next morning, we rose with the sun at five and after a hasty breakfast, packed our belongings and loaded the horse. By shortly after six, after expressing our warm thanks, we were on our way down the valley towards Dasht-i-Rewat. Initially, we followed the dusty path above the village irrigation channels. Then we passed beyond the narrow strip of green fields within the cultivated land of Kaujan. However, we soon found ourselves traversing above the fields of Dirparian, the next of a discontinuous string of villages along the Panjshir Valley.

Our descent gave us beautiful views of each village, its land irrigated by water channelled from the Panjshir or its tributaries. The small areas of cultivated fields in the valley bottom gleamed like bright green jewels strung along the river amid the surrounding steep, stark, dry and rocky landscape. We were committed to reaching Dasht within one day, rather than the two days that it had taken us when ascending. Despite the pleasures of descent, the day seemed very long and was utterly exhausting.

It was easy to forget the frequent essential diversions into side valleys in order to cross substantial streams across narrow precarious bridges. We had no time to stop to boil water, nor dare we take time to purify and drink the river water, which we knew to be contaminated by animal and human waste from villages higher up the valley. Luckily, we had brought some boiled water with us from Kaujan. We were also favoured by being offered tea from time to time by generous villagers along our route. Somehow, we kept moving along at a rapid enough pace and made it to Dasht before sunset.

On arrival, there was a surprise. A small American climbing party was in the village. What was even more surprising was that they had managed to get to Dasht in a Land Rover. It seemed inconceivable that the section of road which had been washed away had been repaired so rapidly with such limited equipment. It was yet another testament to Afghan ingenuity and determination. We made sure that a message was passed along to ensure that when Jim Parry and Mick brought back the generator, they could now come all the way to Dasht in the Land Rover. We had travelled with Mohammed Jan and it was in his house, or rather in his walled compound, that we were invited to stay for the night.

Life in Dasht

In Kaujan, the only trees that could survive the harsh winter temperatures had been the apricots grown for their fruit and the poplars cultivated as a source of timber for construction. Travelling down from Kaujan to Dasht, we had descended more than 2,000 feet. Here, a greater variety of vegetation could survive the winter. The compound was green and was shaded by the broad branches of several large mulberry trees. It was a lovely spot to be able to spend a few days, which was to be my destiny.

The next morning, we awoke to find the women of the household, all in full burkas, shaking mulberries into large cloth nets beneath the trees. After green tea and chapati for breakfast, we were joined by Mohammed Jan, by his cousin Nazir Mohammed and by another senior horseman, Fakir Achmad, who had earlier accompanied us up to the Samir Valley. He was a valuable contact as he spoke a little English, probably gained on his smuggling trips to Pakistan.

He was able to let us know that there was no news of the generator, so we spent the day exploring around the village. I was able to observe the differences between the agricultural practices in Dasht and in Kaujan. Here, I found that the crops were much more advanced. In some places, harvesting was already underway. On the small fields, all work was done by hand. Harvesting relied upon the use of the sickle; even the scythe was unknown, if only because it required too much metal.

Over the next couple of days, I spent a lot of time in and around the village of Dasht. This gave me an even better understanding of the farming systems and the landscape. Meanwhile, Alan travelled further down the valley with Fakir Achmad, having discovered that the generator had been left by Jim Parry, some days earlier, with the headman in the village of Sanjanak. When they left, I had no idea about when they might return. In the event, it was their time of return, rather than the day, that was unexpected.

The women of the household gathering mulberries

The author talking with Nazir Mohammed and Fakir Achmad in Mohammed Jan's compound in Dasht-i-Rewat

Looking over the large new generator

Mohammed Jan's compound was immediately adjacent to the road, so I was able to monitor anything and everything unusual that moved. When the evening bus arrived without them, I assumed that there was no chance of seeing them that day. However, late in the evening, after around nine, I heard a motor vehicle in the distance. This was an unheard-of time for transport in a land where life revolved around daylight. Eventually, a lorry loomed out of the darkness. Alan and Fakir Achmad had made it back and had quite a tale to tell. Not only that, they also had a surprise, or rather a very big surprise. Jim Parry had been unable to get the generator mended and had been forced to replace it with a different and much larger generator. When it was lifted off the lorry, it seemed too large, heavy and bulky to be successfully put on a horse, let alone be carried up a mountain track on horseback.

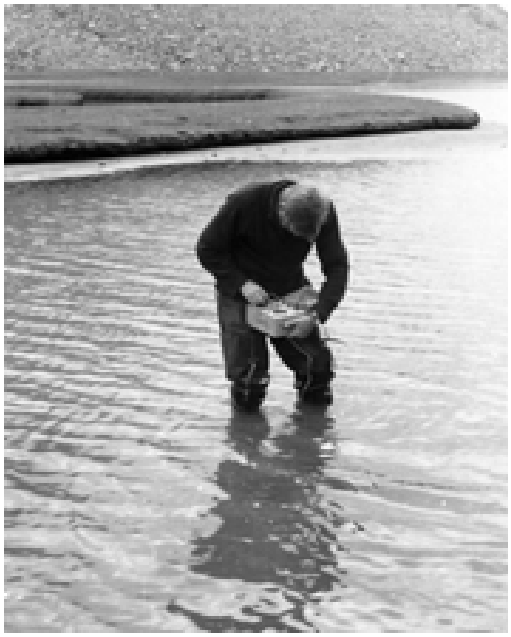
By the time Alan returned, we had run out of almost everything – tea, sugar and even paraffin for cooking. His newly bought provisions were, therefore, very welcome and we soon had a meal organized. During their trip, I learnt that they had suffered a serious breakdown, arguments between drivers, a leaking radiator and all kinds of confusion. They were simply delighted to be back safely with the new generator. Though we were worried about whether the generator could be successfully carried. Mohammed Jan seemed to have no similar anxieties. At five the next morning, with the first light he appeared with his small, grey horse and an even smaller donkey. After a cuppa, some porridge and a jam sandwich, we were ready to load up and set off up the valley.

Harvesting with sickles

Return to the base camp

We were astonished at Mohammed Jan's optimism and ingenuity as he strapped the huge generator successfully and securely onto the back of the small horse. The rest of our gear was to be carried by the diminutive donkey. I left a letter for Jim Parry to collect on his return and we bought fresh fruits and eggs to take up to the base camp. By just after six in the morning, we were on our way once again, climbing out of Dasht into the dramatic Panjshir gorge. At one point, the animals were momentarily alarmed as a snake, bright green and golden, sped across their path. Luckily, they were not spooked. It was a tough journey not only for us, but also for the pack animals. Alan also managed to scald himself while brewing chai at lunchtime, but luckily the injury was not too extensive. We knew from our descending journey that we had no chance of reaching Kaujan within the day. In the event, we scarcely reached Shanaiz, the small hamlet below Dirparian, before nightfall.

The next morning, we were up by half-past four and managed to eat and pack up by just after half-past five. It had been decided that I would push on ahead aiming to reach the base camp before sunset. Alan was to stay with Mohammed Jan and the pack animals and take an extra day. He would ensure that the generator arrived safely. I passed through Kaujan by half-past seven in the morning and enjoyed the milk poured fresh from a skin into which the sheep had been milked. My thirst slaked, I began the steep climb up the Samir Valley past the nomad encampment. Once again, I encountered snakes on the path and, at above 10,000 feet, I found myself increasingly exhausted in the thin air. I had also developed dreadful blisters. It was no encouragement to know that about another 3,500 feet lay between me and the base camp. I feared that I might have bitten off more than I could chew.



Jim Hubbick carrying out measurements in one of the lakes in the Samir Valley

On this occasion, however, I had the benefit of a real stroke of luck. After crossing the first large scree damming the valley, I stopped to smoke my last cigarette as an alternative to eating lunch. In the silence, I thought I could hear distant voices. At first, I assumed it must be shepherds with their flocks, but soon I realized that a party from the base camp had ventured down the valley. They were just descending the next scree to examine the geology, biology and hydrology of the area. My relief in meeting up with them amid the vast landscape was tempered only by the discovery that they had brought no food with them.

By the time I had struggled over the remaining screes to the base camp, my pulse rate and blood pressure were once again sufficiently high to cause some real concern. It took time over the next few days for Pat, our doctor, to interpret what was happening. He had been commissioned to carry out these tests on a regular basis on all

The base camp team (back row, from left) – Mohammed Jan, Marge James, Howard Horsley, Pat Hurley, Jim Hubbick, Sam James, Jan Mohammed and Alan Pendlington; (front row, from left) – Derek Jamieson, Oliver Gilbert, Hal Lister and Dave Beynon.

members of the party by the Medical Research Council. The aim was to understand more about the effects of altitude on human performance. This was a crucial part of the planning for the British team for the Mexico Olympics, due to be held at high altitude. My yo-yo journeys up and down the valley provided evidence that the human body took time to adapt to being at altitude and that repeated ascent and descent greatly hindered adaptation.

The next day, Alan arrived with the generator and work began on recharging batteries and calibrating equipment. While I had been away, other scientific work had continued. In addition, Dave, Jim Hubbick and Olly, all skilled and experienced climbers, had set out a couple of days before to attempt an ascent of Mir Samir. They returned on the same day as Alan, having abandoned the attempt in the face of very bad weather and an impenetrable icefall which they had originally assumed to be a mere snowfield. For a couple of days, all the team, apart from the Pakistan contingent, was assembled together at the base camp.

From time to time, we became very aware of the local wildlife. The presence of snakes at lower altitudes has been mentioned on more than one occasion. At our base camp, we soon became aware of a shrill whistle which seemed to be an alarm call. It took some time for us to identify it as the alarm call of the Asian marmot, a small ginger mammal living among the scree all around us. Worryingly, we discovered that this apparently innocuous animal was supposedly the last refuge of the flea that carried the bubonic plague.

The death of a donkey on a meadow below our camp also gave us the opportunity to become familiar with the local scavengers which soon appeared. Present among them was the huge lammergeier with a wingspan of two and a half metres. Up above our base camp, other wildlife was undoubtedly present, but they were very difficult to observe amid the vastness of the mountain slopes, the jagged rocks and the scree. Topping a ridge on one occasion, I came across a small group of ptarmigans. Then nearby, on a snow slope, I saw huge paw prints, which could only have been made by the recent passing of a snow leopard. On another occasion, during one of the climbing trips, Sam, shivering in his tent, was disturbed to hear, apparently quite nearby, the movement of an animal in the night. He worried that it might be a hungry snow leopard, but accepted that it was more likely to have been its prey, the elusive Himalayan ibex.

After my return to the base camp, the weather took a temporary turn for the worse and we had both hail and snow. While I regained my strength over the next 48 hours, I assisted Derek with some levelling and Hal with writing up results. Once Hal had finished calibration and charging his batteries, he was keen for us to return to work on the glacier. As the assistant glaciologist, my job was to provide him with support. The first task was to carry two large lorry batteries up to the glacier. I was relieved to find that Mohammed Jan was willing to take the larger one, which left me with the second, slightly smaller one.

Research patterns and climbing trips

While the battery I was to carry weighed over 20 lb, that was the least of the problem, for other items had to be carried concurrently. It was, moreover, a potentially dangerous load which needed to be kept upright at all times to avoid any spillage of acid. A very serious handicap was the nature of the carrying frame. It had not taken us long to discover why the army had declared these objects obsolete. They were very light and brilliant for attaching a huge load and making it absolutely secure. However, nobody seemed to have given any attention to the nature of the human frame or to the need to shape the aluminium frame to fit it. Ergonomically, they were a nightmare. It was an excruciating journey, for I was denied the opportunity to slump down and gasp for breath when exhaustion overtook me. There was no alternative to remaining upright and plodding on.

Once delivered, the batteries were soon hooked up and operating the micrometeorological equipment. The next 10 days saw a flurry of activity as we tried to make up for lost time. Different people scurried up and down to the glacier camp to support the scientific work. Notably, Marge always did her fair share of the lifting and carrying. I was expected to work to Hal's demands and never actively disputed with him, for I knew that I was a team member only on his recommendation. There were, however, moments when I felt that Mick, being away in Pakistan, had the best part of the bargain. I was fortunate that other team members quietly tried to shield me when Hal's demands seemed excessive.

A second glacier camp with micro-meteorological instruments in use

On the glacier, Hal was in charge and Alan readily accepted all of Hal's demands. Both were familiar with the line of command because of their experience in the military. Stoical by nature, Alan also held Hal in high respect, a feeling that was reciprocated, for Alan's skills were vital to the success of his research. Alan's task was to constantly maintain the micrometeorological equipment in working order despite the low temperatures. At the base camp, life was equally hectic, and there the main scientific work was being coordinated by Derek. Over a number of weeks, scientific data was being collected continuously over a 24-hour period. It is worth noting that this was long before computers made possible the automatic recording of data. Each of us contributed to a shift system to make it work. One person would take the readings and another would record much of it in longhand. Among our early discoveries was that the minimum overnight temperature, even at the base camp, often fell below minus 11˚C.

Even at such temperatures, we were also expected, all through the night, to plunge our arms into the Samir to regularly collect sediment samples at 0.6 metres below the surface. I would go to sleep with one crew calling out the data and wake up to another crew doing the same before assuming my place in the rota. The conditions were often bitterly cold and always exhausting and tedious. There was, moreover, little

A climbing group sets off for the summit of Mir Samir

While the scientific work around the base camp continued, the climbers among the team mounted a number of attempts on the surrounding peaks.

immediate reward, for the basic data would only be subject to careful analysis back in Newcastle months later. Meanwhile, Olly, ever alert, his magnifying glass at the ready, would wander the meadows and the mountain sides marvelling at the enormous lichens and the tiny alpine plants. To my eternal regret, I never really took enough interest in his work to become anything like a proficient botanist.

While the scientific work around the base camp continued, the climbers among the team mounted a number of attempts on the surrounding peaks. On several occasions, supplies were carried to high altitude to support the climbing parties, who then failed to be able to locate them accurately. On other occasions, extreme weather prevented progress. At times, such attempts descended into farce. Sam and Marge during one attempt on Mir Samir found that they had forgotten essential items, including one of Sam's sleeping bags, and then encountered very harsh weather. Worst of all, on one occasion, Jim and Sam returned exhausted after dark, having had to leave Dave at a higher level suffering from breathing difficulties. As Dave had a whistle and a torch, Derek volunteered to set out and search for him. Finding him relatively easily, he carefully but successfully led him down to the base camp.

In the event, none of these climbing groups reached any higher than 18,000 feet and though a couple of minor peaks were conquered, none was successful in reaching near the peak of Mir Samir. However, it was not only our team that had difficulties. During this period, a very well-equipped specialist Japanese climbing party arrived unexpectedly on our meadow. One of them spoke reasonable English and they also had a Farsi interpreter. Through the latter, we were able to learn more about the life of our accompanying policeman. He turned out to be a poorly paid young man completing his two years of compulsory national service.

Through their interpreter, we were also able to advise the Japanese on the climbing routes we had already explored. Sadly, their party had ascended far too rapidly and they were all, for several days, in a state of collapse. They suffered so badly from altitude sickness that they eventually had to descend and camp lower down the valley before returning some days later. Even then, their initial attempt on Mir Samir's summit proved unsuccessful.

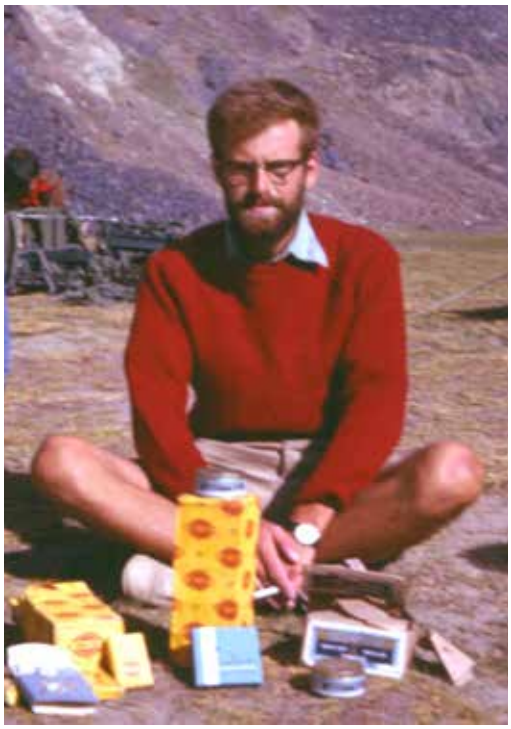
By 21 August, we had, after several tiring days, moved almost everything back from the glacier camp. This was easier said than done as, apart from the tents, cooking equipment and personal gear, a substantial amount of equipment had been carried up and had accumulated. The most bulky and awkward item was the huge aluminium frame for Derek's stilling well, which had been carried up slowly in stages. On the way down, Derek carried it in an uninterrupted trip, an impressive feat of fitness and endurance by any standards. I just about managed to keep up with him carrying only the stilling well head, the almost weightless float and a tin of dichromate. Eventually, the glacier camp was closed down and even any indestructible rubbish was returned to the base camp.

Unexpected arrivals

We were now already winding up the base camp and beginning to pack the gear for the journey down the Samir and the Panjshir back to Kabul. It was mid-morning one day when we were surprised by the unannounced arrival of Mick and Nazar Mohammed, Mohammed Jan's cousin. Mick was made particularly welcome, having brought with him enough cigarettes and tobacco to last us for the next month. He also brought some mail which had arrived via the British Embassy in Kabul. It was the first news of the outside world we had received for over six weeks. Among the good news was the discovery that Jim Hubbick and Marge, both teachers, had been awarded a 13 per cent pay rise in their absence.

More sobering was news of trouble between the UK and Spain over the status of Gibraltar and of the withdrawal of Singapore from the Malaysian Federation. The news of events developing in Vietnam was even worse. The war had escalated at an unprecedented pace during that summer. Another piece of news from home was about the very poor summer weather in the UK. Mick also brought some bad news that directly affected us. A serious outbreak of cholera had been confirmed in the area around Kabul. This tended to confirm Pat's tentative diagnosis of my dreadful illness when we first came into the Panjsir Valley. More importantly, it now threatened our flights back home. These were booked via Moscow, the cheapest route. The USSR, responding to the cholera outbreak, had now stopped all flights from Afghanistan.

When Mick arrived, Hal had been on a final trip to take measurements on the glacier. When he returned in the evening just before dark, he read his mail, which included the most sobering news of all. One of the people who had withdrawn from our expedition at the very last minute had tragically died in a climbing accident over the summer back in the UK. It reminded us that whatever were the difficulties and frustrations that we had suffered so far, we had escaped fatalities and, almost miraculously, all of us had avoided serious injury.



Mick Earl with the cigarettes he brought from Pakistan

The story of Mick and Jim Parry's trip to Pakistan was itself pretty hair-raising. Arriving at the border at Torkham, below the Khyber Pass, they found that their documentation, though perfectly in order, was not accepted. A phone call to the British Embassy in Kabul proved entirely fruitless as no one could be found there to speak the local languages. In sheer frustration and in an attempt to get an interpreter, Mick leapt the barrier. An Afghan border guard raised his rifle as six Pakistani border guards leapt on him – he was promptly arrested. The action may have been extremely reckless, but it broke the impasse.

Mick also brought some bad news that directly affected us. A serious outbreak of cholera had been confirmed in the area around Kabul.

Mick was interrogated on the Pakistani side, but was extremely fortunate to get assistance from Col Eric (Buster) Goodwin, a legend on the Khyber, who just happened to be at Torkham. Jim Parry was soon allowed to cross the border with the vehicle. Then within half an hour, they had completed the formalities and were both free to proceed to Peshawar along the Khyber Pass. Within Pakistan, they had wonderful cooperation from a number of companies who had been committed to supporting our original expedition to the Karakoram. Brooke Bond, British American Tobacco and ICI, among others, had given them supplies enough for themselves and for the rest of the expedition, including provisions for the return journey to the UK. Sadly, there was little success in obtaining the rock-core drillings from the Deccan – something that was so crucial to Jim Parry's pioneering work on the movement of tectonic plates. This was a consequence of another serious equipment failure.

Taking a break on the arête

After an evening listening to their tales, we headed into our sleeping bags. Several of us had already planned a final climb the next morning. It was our last chance before departure and we had a particular peak in mind. We had named it "Pyramid Peak" and estimated its height as well over 17,500 feet. Although he had only just arrived, Mick was keen to make the effort and go with us. This was a bold decision, for, unlike the rest of us, he had not lived at high altitude for more than a few days at the outset of the expedition.

We awoke at half-past four and in the low morning temperatures, huddled in the mess tent hoping to gain some benefit from the warmth as our porridge was cooked. It warmed us and filled our stomachs. We then packed minimal provisions for lunch and a snack. Since our supplies were running low, our main sustenance was dry porridge oats. We took no water, relying if necessary on the streams or on the pristine ice and snow. Finally, we wrapped ourselves up warm, took ropes, belay equipment and ice axes, and before half-past six, in the early light, were ready to set off. There were in total seven of us. Several had never attempted to climb such a high peak before. Mick and I had never even scaled the highest peaks in Britain.

I had no great expectations of being in the party to reach the summit. However, having recently spent a protracted time at altitude either at the base camp or the glacier camp, I was in considerably better physical shape than previously. Both my blood pressure and my pulse rate were near normal and also fairly stable for the first time. Derek, Marge and I made rapid progress, arriving shortly after half-past seven at the lip of a large corrie (see front cover), the first readily identifiable agreed resting point. Here, we sat quietly waiting for the others with the bright early morning sun revealing a stupendous scene. Into the far distance, an endless succession of peaks, corries and glaciers stretched out before us. It was a wonderful photo opportunity, of which we took full advantage. From the corrie, we knew we would have to choose a suitable route to follow towards the summit.

Heading for the summit

As we sat and waited, it became obvious that we needed to scale the arête to our right and then follow it to the summit. If we could reach the edge safely, we calculated that things might become easier. From here on, raw climbing skill would become crucial. We had by now learnt that Olly was by far the most nimble-footed among the party in the most demanding of environments, a skill no doubt nurtured in plant hunting. In recognition of this status, he had earned the nickname "Ibex Features". So, he was the obvious choice to lead from now on, and lead he did. It was fairly depressing for the rest of us to see him making such rapid, unimpeded progress. Eventually, he reached the ridge and sat in the sun to await us. It took 20 minutes even for Derek to reach him. I took a further 10 minutes.

Marge was yet another 10 minutes behind me, while the rest of the party, Jim Hubbick, Mick and Pat, were in danger of losing touch with us. The place where Olly had chosen to halt was atop the ridge at around 17,000 feet, some 3,500 feet above the base camp. The location offered intensely dramatic views. Huge mountain ranges stretched in all directions and azure blue lakes lay amid the snowfields. It was also a place that offered a chance to take individual photos, as if we were each alone atop the entire Himalayan world.

One of the series of photos is very revealing, for it shows Derek looking as fit as a fiddle, while Jim, who had just arrived, is clearly in serious trouble and fighting for every breath. From here, it was clear we could not make any further safe progress without roping up. The composition of the roped parties was simply determined by our sequence of arrival on the arête. Thus it was that I found myself, as the least experienced, roped safely between Olly and Derek, the two members of the party who had consistently proved themselves the fittest members. It was a novel experience; till then, I had found myself among the also-rans. Suddenly, I found myself with a realistic chance of reaching the summit. It was an unanticipated situation. As we headed upwards, Jim Hubbick and Marge were roping up behind us, but they intended to wait briefly to see if any others wished and were capable of joining them.

Derek Jamieson on a pinnacle, looking fit while Jim Hubbick is struggling for breath

The climb along the arête was a revelation, never to be forgotten. It was easy to see how an arête preserves its own narrow and steep profile. The rock was deeply shattered and one had to test each step to ensure that the handholds and footholds remained secure. Between the cracks in the rocks, ice lenses could be seen. The ice in the cracks was beginning to melt in the bright sun, but was fated to freeze and expand again at night, cracking the rock further open. Now it was easy to understand why one heard rocks

The author occupies a dramatic spot for a photo

Resting at the col: Derek (left) and the author

It was easy to see how an arête preserves its own narrow and steep profile. The rock was deeply shattered and one had to test each step to ensure that the handholds and footholds remained secure.

tumbling when sleeping at the glacier camp. Progress was slow and hazardous despite the ropes.

First, we were on rock. Later, there was a steep snowfield ahead which could not be circumvented, other than by a circuitous descent, as it clung to the entire arête. We would have to negotiate it before returning to the rather safer rock ridge above. Crossing the snowfield was a terrifying experience, not least because of the 3,000-foot drop below. One false step and we would risk instant death. Without crampons, we needed to secure firm steps into the snow and ice without being too aggressive. Ill-luck might dislodge the entire snowfield and we could find ourselves tumbling amid an avalanche. Olly led the way, while we belayed him astride the arête. When it was my time, the major fear of falling to my death was only at the back of my mind. Much more immediate was the simple risk of slipping on the snow and ice. Boldness and care had to be combined. I was delighted to reach the rock surface without mishap and Derek rapidly followed.

Climbing carefully along the arête

Back on the rocky arête, we took stock of our situation. It was now approaching one in the afternoon. Looking back, we could see Marge and Jim roped together, but making only slow progress some hundreds of feet below and behind us. Waiting for them at this stage did not seem a wise option. At this altitude, he who hesitates is most certainly lost. To reach the summit, we needed to press on. Of the rest of the party, we could see nothing. We later learnt that

Looking over the 3,000-foot drop

they had all become exhausted and turned back. Now ahead of us was an apparently straightforward route to the summit.

We continued carefully along the still steep arête for a further hour, using the maximum length of rope to belay one another regularly. However, at around two in the afternoon, we realized that Jim and Marge were no longer following us. The air seemed to have grown very thin, and every step was a struggle. Eventually, we reached a dramatic col, located about 50 or more feet below the twin summits. Here, a platform of snow, ice and rock was large enough to accommodate all three of us together. There was a sense of relief in the anticipation of rapidly completing the climb. The platform of ice and rock made us feel relatively secure compared to the previous hour. We stopped briefly while Derek pulled out cine film and we took still photos. Some of these reveal a rather impatient and less than cautious attitude. After taking breath, we were off on the last lap.

Once again, Olly led and demonstrated both his agility and his excellent reading of the rock in choosing the best route. He made

As if in slow motion, I rotated off the ridge and across the bare rock face to the north. With both hands, I grabbed at anything that might slow me down or, better still, stop me. I knew that below was a sheer 3,000-foot drop!

a belay and encouraged me to follow him to a secure spot. Olly realized that I was no longer capable of offering a secure belay to Derek. Instead, he used my rope to belay Derek as he followed us. There was just enough room for Derek to find a secure spot on a substantial ledge just below us. The rope sections were now sufficient for us to reach the summit in a single move. While I gathered my strength, Derek belayed Olly as he made his way to the summit. Now it was my turn. Olly was belaying me and had made the last section seem a piece of cake. I set off in something of a daze, my mind probably befuddled by the reduced oxygen levels in the air. Halfway between Olly and Derek, I found myself lacking an obvious handhold. Although I was secure enough with three points of contact, I could see no way forward.

Exhausted and with a sense of alarm at the abyss, now dropping away on every side, I grabbed the rope to steady myself. Bad move! The rope was there only as an emergency measure. It was not a fixed point and having moved some of my weight onto it, I began to swing. Panic set in. Within an instant, I lost all sense of balance and swung off. As if in slow motion, I rotated off the ridge and across the bare rock face to the north. With both hands, I grabbed at anything that might slow me down or, better still, stop me. I knew that below was a sheer 3,000-foot drop! There would be no chance of surviving such a fall. Luckily, Olly remained utterly calm. We might just have been on a training exercise back on Simonside Fell.

Taking all my weight, he gently lowered me onto a ledge which was conveniently placed on the north face. I dared not look down and was so terrified that I uttered not a word. Olly's calm voice asked if I was now

The view south from the summit

The view over our study glacier from the summit

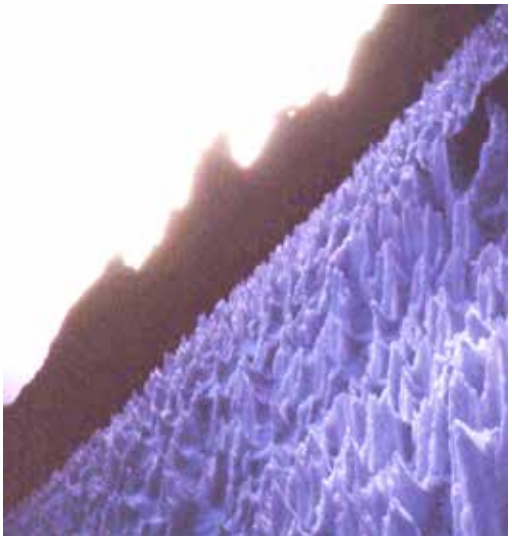
OK. I could hardly summon the powers of speech, for I was shaking like a leaf. I do not remember screaming or even shouting. I had been simply paralysed with fear. I clung to the rock in my new location like a limpet. My head was spinning and my knees were knocking. Somehow, I let Olly know that I was in a safe position. I dimly remember Olly then asking Derek if he felt he could progress along the ridge top without a belay from me. Ever calm and confident, Derek replied in the affirmative. Slowly and carefully, he made his way up to a secure platform just below the summit.

I was now attached to two different climbers, each of whom could belay me as I headed for the summit. All I needed was the confidence to move. I took several deep breaths before I could summon the necessary courage and energy. Luckily, from this new location, the route to the summit seemed an easy one. Nonetheless, it was the hardest 20 feet I have ever climbed. By the time I joined them – the third man on the mountain* – all the energy seemed to have drained from my body. I slumped to the ground, utterly exhausted.

Olly and Derek, no doubt, felt a sense of elation on the summit. I could only feel immense relief, combined with immense gratitude that I had been in such good hands. Olly handed around dry porridge oats as iron rations to restore our energy levels. Upon taking the oats from him, I found that all my finger ends were bleeding where I had tried to grab hold of the rock. It took me some time to finally take in the scene. The drop to the next valley below us was awesome, for it lay on the steep north side of the mountain. The glacier far below was where I would have landed had Olly not held me securely. On the way down, I would undoubtedly have repeatedly bounced off the rock face. Survival would have been utterly impossible. Even had I reached the glacier with only a few broken limbs, there was no way anyone could have descended to rescue me.

On the peak, Olly had found a low cairn made up of small rocks, a sure sign that someone had been there before us. Within the cairn, sure enough, was a rusting tin containing a piece of paper with the names of three German climbers, members of a survey team who had reached the summit some years previously. We now added our names to theirs and gradually took in the scene.

It was a remarkably clear day, and all around, in every direction, were seemingly endless mountain ranges, with each peak outlined by the shimmering glaciers on its flanks. It was a scene of such breathtaking beauty that I found it difficult to take it all in. Olly tentatively identified the peak of Tirish Mir, lying north-east of us in the Karakorum range of Pakistan. Far beyond it, wreathed in clouds, lay what, by its height, he believed to be the slopes of K2, the world's second-highest peak. It seemed



Penitentes, which acted as belay points on our descent

Afghan horsemen partying on our last evening in the Samir Valley

more than possible that the scene around us included the peaks not only of the Hindu Kush and the Karakorum, but also of the Pamirs to the north-west and the Himalaya far in the east.

Focussing closer, we were high enough, at over 18,000 feet, to look down at the glaciers of Mir Samir around 1,500 feet below. The south-west glacier, where we had worked for several weeks, was mirrored by a similar, but larger, glacier on the north-west side, separated from it by a steep arête. This was the arête onto which Ollie had climbed on his solo recce some weeks previously.

It was by now half-past three in the afternoon and we needed to reach the base camp by nightfall if at all possible. It is well known that many of the worst climbing accidents arise on the descent rather than the ascent. It is during the descent that the climber is often the most vulnerable, lacking in good judgement, tired and at risk. This is something I have been aware of on several subsequent climbs. On this occasion, I was blissfully ignorant of any potential danger. My main priority was simply to stay upright and on my feet. Amazed to be still alive, I left all the decision-making to Olly and Derek, who kept me going. Had anything happened to them, I would scarcely have known in which direction I should head.

We made an extremely rapid descent of the first section of the mountain by heading down a steep gully full of penitentes. These are a kind of jagged, upside-down icicle, caused by solar melting, which conveniently make for really excellent belay points. Later, we made our way down into the deep corrie from which we had commenced our ascent to the arête early that morning. Here we came across Pat, who was accompanying Jim Hubbick, laid low by what he thought was a severe migraine attack. In reality, it was more likely to have been an early stage of altitude sickness. The rest of the party had headed down more rapidly. Happily, we arrived back at the base camp before dark to warm congratulations all round. Hal, for the first time, seemed genuinely pleased by my achievement.

When my pulse and blood pressure were taken that night, Pat found them to be lower than on almost any previous occasion. As I dozed off, I reflected that I had climbed an 18,000-foot peak at the tender age of 20. I slept like a baby, so glad was I to be alive. This was particularly surprising as there was a great deal of noise from the Afghan horsemen who had arrived while we were away for the day's climbing. They spent the whole night in celebration, singing and dancing round the campfire on which everything we no longer needed was being burnt. The next morning, I awoke to find the camp being struck. Our time in the dramatic Hindu Kush was over.

**Third Man on the Mountain* was a very successful Disney film of the time directed by Ken Annakin, who had been to the same small school as my father.

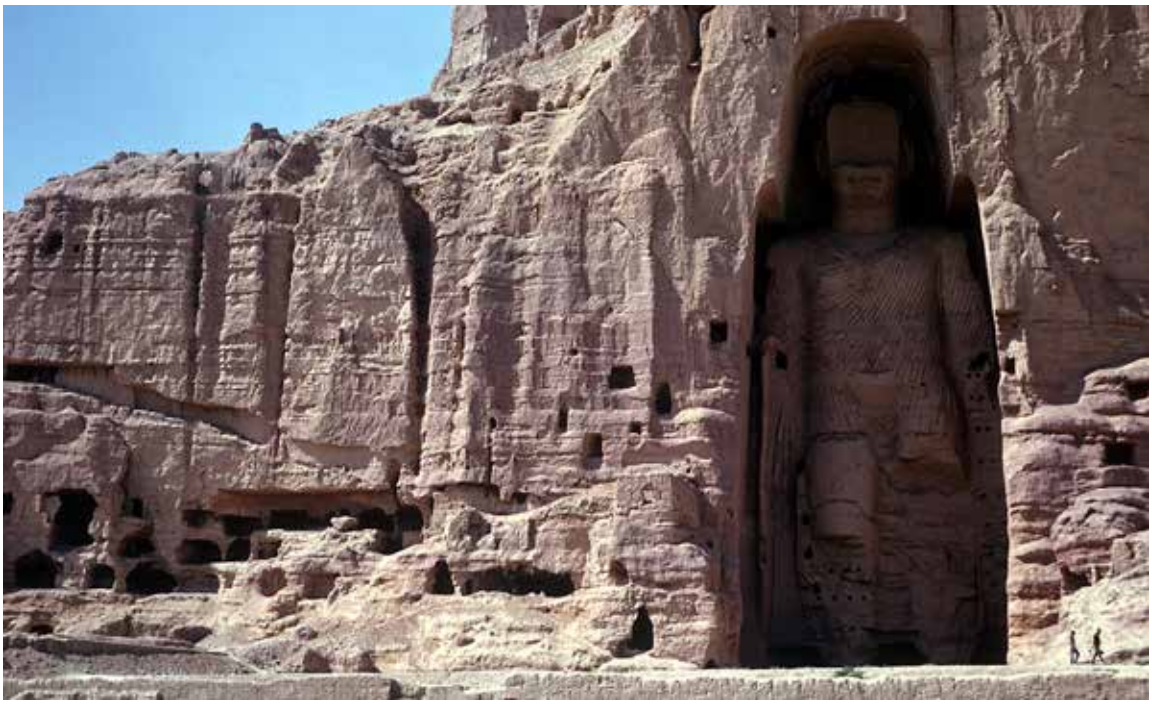
Epilogue: The journey home

Planning an expedition is a complex matter, especially when the area of study is so far away from home. The original plan was for half the party to travel out by land and the other half to return by land. With a month on the road in either direction, the total duration of the expedition spanned four months. Unfortunately, after our departure in early June, several members of the party due to join us by air had withdrawn from the team. This meant that, whereas the outbound group by land had consisted of eight people, only four people had joined us by air rather than the eight we had expected. Sam, showing his usual sangfroid, decided that he must join those returning by land to ease the driving burden. Hal was keen to suggest that Mick and I too join the party, but Sam rejected this suggestion, not least because I was not even a driver.

First, however, we had to descend the Samir and then the Panjshir valleys. The return journey provided fresh views of equally dramatic scenery as the ascent. This part of the journey also gave us our first experience of an earthquake, known to be common in the area. Luckily, we saw no landslips and the overall damage in the villages was not devastating, though in one village a life had been lost when a roof collapsed.

Once back on the road, it proved relatively easy to reach Kabul, but leaving the country was more of a problem. The cheap flights we had booked via Moscow had been cancelled thanks to a confirmed outbreak of cholera. The land border with Iran had also been closed. As a temporary distraction, Sam decided we should visit Afghanistan's most renowned tourist venue. Thus it was that we took a trip to the ancient Buddhas of Bamiyan and my lifelong fascination with the Silk Roads began.

With no change in the Aeroflot policy, we had to seek another way home. It is fascinating to reflect on the complexity of air travel at that time. Eventually, we found alternative flights back to the UK, leaving on Ariana, the Afghan airline. However, we had to travel via Kandahar to Teheran and then on to Beirut. After a night in Beirut, we then took a Pan Am flight, again stopping twice en route to London, arriving home almost exactly three months after our initial departure.



The large Buddha at Bamiyan with Derek and Olly (bottom right)

Research analysis

Arriving home safely was exhilarating, but the work of report writing was still to begin. The detailed analysis of the overall research findings took many months. It was only two years later that the final expedition report was made available.* Publication in academic journals took even longer. Nonetheless, some important results were immediately obvious. It had become clear that the glacier was vulnerable to any rise in temperature and any reduction in its size would then adversely affect its microclimate. A cycle of further recession then became likely.

The application of cross-referenced observations by experts from different disciplines was also enlightening. The recession of the glacier was, for example, clear from the position of its snout in relation to the terminal moraine. The expertise of our lichenologist on the growth rate of those lichens found on exposed rocks then provided a useful means of measuring the likely rate of recession. Such correlation of findings from different areas of study proved the value of the interdisciplinary approach that was adopted on the expedition.

Alan calibrating an instrument

Any ability to generalize confidently across the region from such a singular research project was lacking in the absence of comparative data. The organizational complexity of this early expedition made it difficult and expensive to be repeated anywhere else in the Hindu Kush-Karakorum–Himalaya region. Increasing political instability in the region in subsequent decades became a serious disincentive to planning any similar large-scale expedition. As a result, ground-based investigation of the montane glaciers of this important zone has lagged badly behind the investigation of glaciers elsewhere.

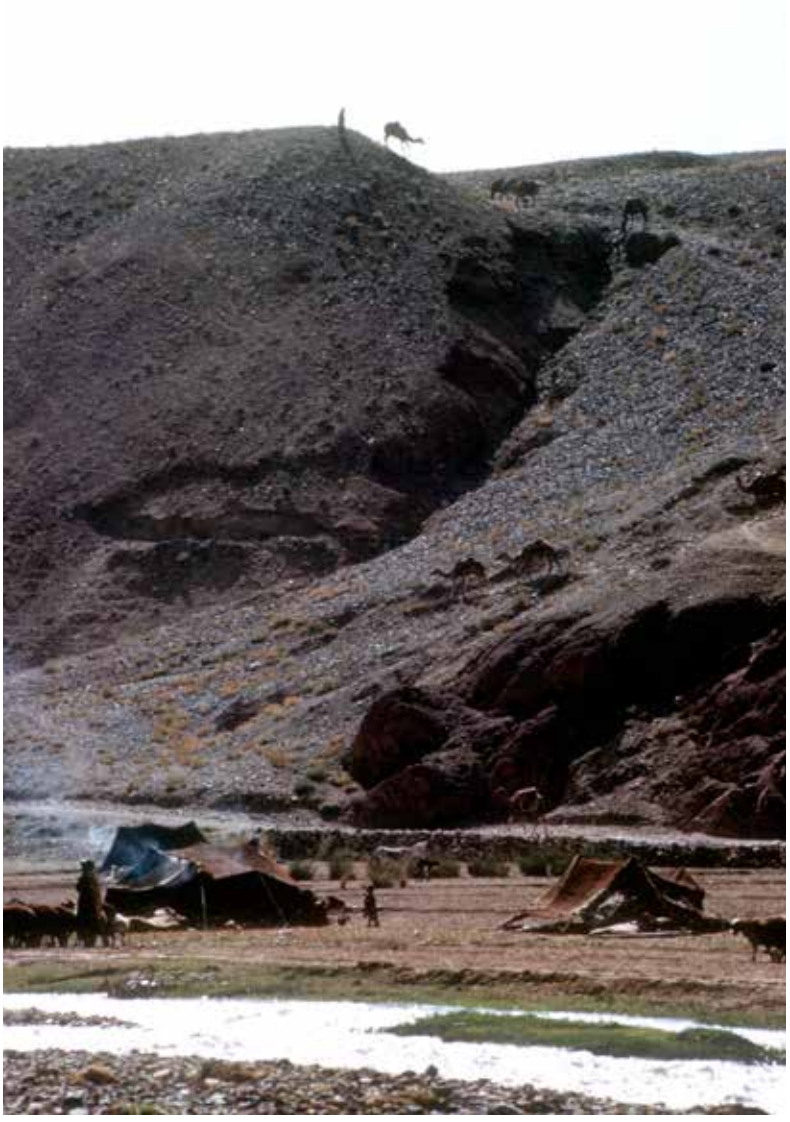
It took until the mid-1980s for any academic institution to be established to foster greater knowledge about the shared environment of the peoples of the Hindu Kush-Karakorum–Himalaya region. The creation of the International Centre for Integrated Mountain Development was an important step forward. For the first time, the shared experiences and the shared responses to the challenges of this Asian mountain region were being properly documented to aid regional development.

Even today, however, most of the regional research is focused on the human response to the environment. Less attention is paid to understanding the basic parameters of the glacier-fed water supply which underpins so much of the human and economic life in the region. There is as yet no research body dedicated to glaciological studies across the entire region. Apart from other considerations, glaciologists are still attracted to the more prestigious and well-financed research bodies working in the polar regions.

Hal's previous experience in glaciology had been of just such major expeditions in high latitudes covering a long time frame. Their

scale had enabled the production of more robust results of lasting importance. He was undoubtedly disappointed that we had to concentrate all of our efforts on the study of only one of the glaciers of Mir Samir. Hal also recognized that our kind of research could never be replicated over a significant proportion of the thousands of glaciers across the region. That the 1965 expedition accomplished so much is remarkable given the many constraints.

The research of our expedition was threatened initially by the enforced relocation from Pakistan to Afghanistan. We suddenly and unexpectedly found ourselves working in an area unknown by any member of the team. It was also a much more remote area than we had planned for and this was made all the more hazardous by the absence of any reliable maps. We also had to travel a considerable distance away from roads and to arrange local transport to reach an only vaguely identified destination. Being so remote also meant that any equipment failures were difficult to rectify.



An overnight nomad encampment

The entire region was much less well documented than our original research destination in Pakistan. Indeed, we were unable to trace any published research findings about its characteristics prior to departure. Over and above the challenges that I have already outlined was that of language. In Pakistan, one of the least disputed positive outcomes of British colonialism was a widespread familiarity with English. The extremely successful Afghan resistance to colonization meant that during our entire stay in the Panjshir Valley, only one local person, the smuggler in chief, spoke good English.

Ironically, some of our research effort was directed to issues raised by NASA. Its later skills in satellite monitoring have since made it the world leader in providing the data necessary to track glacial retreat across a region which remains of global importance. Despite this evidence, even into the twenty-first century, basic data on these glaciers remains incomplete and their mechanisms poorly understood. The rivers that they feed provide drinking water for the people and irrigation water for the crops of some of the world's most populous countries. It is now apparent that any serious decline in the volume of water that they provide could give rise to major patterns of national and international migration.

The visionaries

What has become increasingly clear with the passage of the decades is the visionary determination of Hal Lister and Sam James in attempting to mount such an ambitious expedition. From their different perspectives, both of them recognized that there were important questions to be answered. The challenges faced in organizing such a major expedition – logistical and financial as well as technical and geopolitical – still remain considerable. Moreover, changes in technology and surveillance capability have been so fundamental that our expedition seems, in its scale, to have been unique.

The 50th anniversary reunion of surviving members of the expedition. This took place at Newcastle University in April 2015. From left: Professor Michael Earl, Dr David Beynon, Dr Sam James (Expedition Leader), Professor Derek Jamieson, Howard Horsley