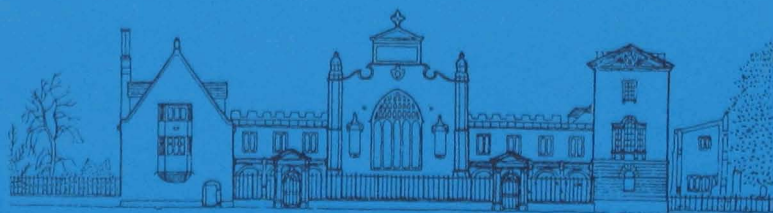


PETERHOUSE ANNUAL RECORD

2001/2002



small exhibition on Max's life and work, including family photographs and delightful letters from Max to his grandchildren, complemented the earlier talks.

The following day a Memorial Symposium heard scientific presentations from colleagues and collaborators of Max, most of whom, besides describing their own current work, included a tribute to his scientific or personal influence on their careers. The meetings

provided a fitting memorial to a man of wide cultural interests and huge scientific achievements, whose presence in the Laboratory and the College is greatly missed.

R.A. Crowther

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A PETREAN ON EVEREST 1951-53

I. The Abode of Snow

Lying on the border between Tibet and Nepal, for centuries two of the most politically inaccessible countries, Mount Everest or Chomolungma as it is called by the Tibetans is surrounded by four peaks of over 26,500 feet in a tangled region of peaks, passes, glaciers and valleys. Its exploration and ascent was more complex than that of any other peak for one fundamental reason, because at 29,028 feet it is a thousand feet higher and climbers attempting the summit are living 'beyond their means'.

Although discovered as the world's highest peak by the Survey of India following routine surveys of the Himalaya, in the mid-nineteenth century from the plains of India a hundred miles to the south, an on the ground identification had to wait until Henry Wood of the Survey identified it from the south in Nepal in 1903, and in 1904 from Kampa Dzong in Tibet during the Younghusband mission to Lhasa. Further confirmation came during this mission when no other peak of a similar altitude was found by a Survey Party, which included Wood, that travelled in South Tibet, north of the Himalaya, along the Tsangpo Valley to Gartok in West Tibet.

It was nearly twenty years before the first Reconnaissance Party was given permission by the Tibetan Government to approach the mountain from the north. The first three attempts in 1921, 1922 and 1924 broke much new ground topographically and medically. In 1921 extensive mapping was completed

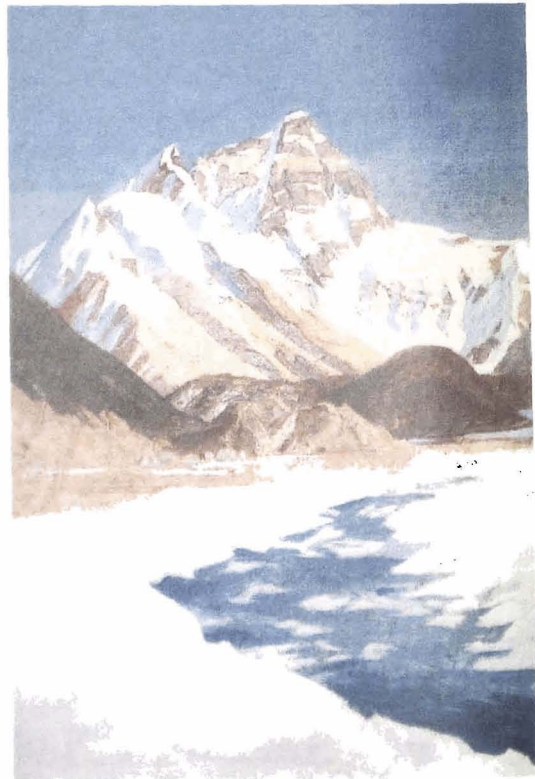


Photo: Reproduced by permission of J. L. Somervell

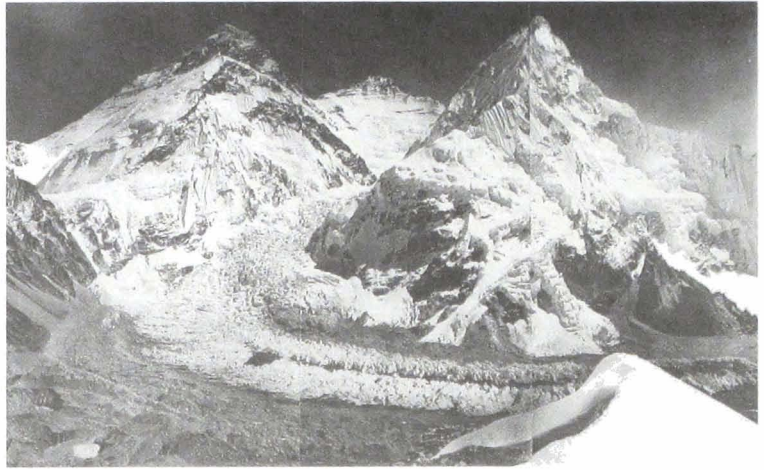
The North Side of Everest by T. Howard Somervell, O.B.E. F.R.C.S. He was a Caian and on the 1922 and 1924 Everest Expeditions (see p. 65).

by the Survey of India Party, one of whose members, E.O. Wheeler, found the easiest route on the North side after the failure of the mountaineers, including Mallory, to do so. So efficient was this group that by the time the main party left Calcutta for the U.K. a preliminary map of the north side of the mountain was completed.

The purpose of the 1922 and 1924 parties was simple – to climb Everest. The use of supplementary oxygen was gone into in some detail and decompression chamber studies carried out at Oxford. In 1875 on a well-documented balloon ascent by three Italians, not using supplementary oxygen, two had died at 28,000 feet, whilst the third had survived by venting hydrogen and descending. However, two British Meteorologists, Coxwell and Glaisher, during the same period had ascended to a similar altitude by balloon and had acclimatised to these altitudes. In 1922 supplementary oxygen was used but there was no clear-cut improvement in climbing rate over those using long term acclimatisation. However, in one party the use of supplementary oxygen prevented hypothermia and was life saving.

In 1924 Norton and Somervell reached a height of 28,000 feet relying on acclimatisation alone but Mallory and Irvine using supplementary oxygen were lost on the upper slopes. Mallory's body at a lower level was found in 1999 by an American party – with evidence he had fallen. The four expeditions of the 1930s failed to get any higher, then World War II interrupted all attempts. Following the Chinese takeover in Tibet no further attempts were allowed from the north. But in 1949 for the first time in history Nepal allowed Europeans into her country.

Because access to the Everest Region on the southern Nepalese side had been negligible, mapping had been sparse, relying on the original Pundit (secret native explorers of the Survey of India) Surveys of the mid-nineteenth century. It was not until 1933 that a modern map of the Nepalese side was drawn following an aerial survey. It was an extraordinarily detailed map made by A.R. Hinks, a mathematical cartographer, and M.D. Milne, Chief Draughtsman, both of the Royal Geographical Society (R.G.S.),



From the south-west the north col, summit, south col, Luotsu, Western CWM, Nuptse ice-fall.

Photos: Courtesy of Michael Ward.

using oblique and vertical photographs. This was supplemented by exploratory parties starting in 1951 by myself on the Everest Reconnaissance and continued through to 1955 and this filled in the blanks on the southern side. Later the first detailed map of both the Tibetan and Nepalese side of the Everest Region was completed in 1961 by G.S. Holland of the R.G.S. Revised in 1975 this map remains the gold standard map of the area. The irony of the vital Milne-Hinks Map is that by the time Nepal was opened to mountaineers it had been forgotten and 'lost' by the R.G.S.

II. A Positive Outlook 1951–1952

After two years completing the normal three-year Tripos in the basic Natural Sciences at Peterhouse I did my clinical training at The London Hospital in Whitechapel. House Officer posts in the East End were followed by two years' National Service from 1951 to 1952 in the R.A.M.C., first at the Royal Herbert Hospital, Woolwich, and later under attachment to the Brigade of Guards.

As one of the leading climbers in the U.K. – all of us amateurs in that era – I very naturally had a great interest in climbing Everest. In fact I was introduced to climbing when I was sixteen by E.G.H. Kempson, a mathematical Wrangler and Housemaster at Marlborough, who had been on the 1935 and 1936 Everest Expeditions. There were two obvious obstacles: first a new route from

Nepal had to be found and the second was medical. This was evidenced by the total failure of each expedition mounted by the Himalayan Committee (drawn from the Alpine Club and the R.G.S.) to solve the medical and physiological problem of 'the last thousand feet'. The technical climbing difficulties on the northern route were not great being roughly equivalent to the normal route on Mont Blanc, first ascended in 1786.

In early 1951, to find a route from the South, I searched the dank, filthy and uncatalogued archives of the R.G.S., examining each photo of the three to four thousand taken on the pre-World-War-II expeditions. After several weeks I was no further forward since all the photos were taken from Tibet. Towards the end of my marathon sessions I came across two buff unmarked envelopes. Inside were photographs taken on covert flights over Everest in the late 1940s. Though many were wrongly labelled as being of Makalu, a peak over 26,500 feet high thirty miles to the east of Everest, it was quite obvious that a reasonably easy route existed to the summit from Nepal via the Western Cwm, Lhotse Face, South Col and South East Ridge, once the formidable Ice Fall guarding the entrance to the Western Cwm had been overcome. So I turned my attention to the Map Room. The staff were aware of the existence of the Milne-Hinks map, but could not find it and at that time there was only one copy known. I urged them on to make a thorough search; and eventually it was unearthed.

This map confirmed the route shown by the aerial photographs. Armed with this information I got in touch with two friends, Bill Murray, a leading Scottish climber, and Tom Bourdillon, a leading British climber; and we asked the Himalayan Committee to back a reconnaissance. To my fury they refused and we soon found out why. Unknown to us in the winter of 1950, H.W. Tilman, the leader of the 1938 Everest Expedition and a highly experienced Himalayan explorer, had visited Khumbu and was adamant that no route existed. 'Impossible' was his verdict. It was obvious to us, if not to the Alpine Club and the R.G.S., that he was totally mistaken and



Photo: Courtesy of Michael Ward.

The Ice Fall.

we continued our preparation regardless. We were certain that somehow we would be able to carry out a reconnaissance and if this confirmed a viable route from Nepal a fully equipped attempt on Everest would follow swiftly.

However, it was clear to me and Tom Bourdillon that unless the medical and physiological problems were identified and solved – and adequate supplementary oxygen was only one part of the solution – any hope of reaching the summit might be seriously compromised yet again. With this in mind, and now having experience of the intransigence of the Himalayan Committee, I decided to address the medical details in London while Bill Murray concentrated on the organisation of the expedition in Scotland.

The Royal Society with their record of high-altitude investigation into the oxygen transport system associated with Joseph Barcroft of Cambridge and others in the 1920's and 1930's were likely to be interested. Therefore I approached Russel Brain (President of the Royal College of Physicians and an F.R.S.) to whom I had been a House Physician for a short period. He advised me

to contact the Medical Research Council. Co-incidentally Tom Bourdillon's father, a Research Physician with the M.R.C., contacted me and I arranged a meeting with Dr Griffith Pugh of the newly formed (late in 1950) Division of Human Physiology of the M.R.C. at Hampstead.

During World War II Pugh had worked on the problems of cold and high altitude at the Mountain Warfare School at the Cedars of Lebanon in the Middle East. Thus at the M.R.C. he unofficially conducted the primary research into all the high-altitude problems and the various forms of cold injury including hypothermia and

frostbite. Also strokes, chest conditions, gross dehydration leading to chronic fatigue, hallucinations, personality disorders and severe mental and physical deterioration and an appreciable mortality rate – a daunting workload. All these conditions had been found in young men who were fit at sea level when they were exposed to high altitude. 'Sick man climbing in a dream' (the words of the Himalayan Explorer of the thirties, Eric Shipton) perfectly described their condition and hence the repeated failures to reach the summit of Everest.

Realising that we were intent on our reconnaissance and Eric Shipton, recently returned from Kunming, had agreed to join us as the nominated leader, the Himalayan Committee changed their mind and backed us and *The Times* gave us some financial support although we each paid our own way to some extent. This was the first privately organised Everest Expedition and it could be said the Himalayan Committee jumped on our bandwagon. Shipton had turned down many English climbers who wanted to join us but invited two New Zealanders of a party of four who were already climbing in the Himalaya to make us up to a party of six. One of them was Ed Hillary.

This was an extremely happy and fruitful expedition. It confirmed the route I had



Everest 1951: Members of the Reconnaissance Party in the grounds of the British Embassy at Katmandu. E. E. Shipton, M.P. Ward, W. M. Murray, T.D. Bourdillon.

Photo: Courtesy of Michael Ward.

'discovered' in London and, although the Ice Fall proved extremely dangerous, we knew a fully equipped party would overcome it. We then carried out a number of exploratory journeys, when accompanying Shipton I developed an interest in this side of mountaineering, we returned to Kathmandu. I was incandescent with rage to find the Swiss had obtained permission to attempt Everest in 1952. But this turned out to our advantage.

Pugh now had time to carry out field trials and in 1952 a British party led again by Shipton went to the Himalaya with the double aim of verifying his laboratory work and climbing Cho Oyu, a peak of 26,500 feet twenty miles west of Everest. The Army decided I should not continue my National Service in Himalaya so I did not go. Shipton was to test a larger team of high altitude climbers with a view to tackling Everest in 1953. The science was an unqualified success, but failure to climb Cho Oyu was mainly political in that the only viable route was found to be in Tibet and Shipton was not prepared to 'trespass' – quite reasonably but to the disappointment of some. Then Shipton decided not to return immediately but carry out some further exploratory work. This was a terrible mistake. Following the Swiss failure it was felt he should have returned immediately to start organising for 1953. Following

our success in 1953, Sir Edwin Herbert (Lord Tangle) created The Mount Everest Foundation to replace the archaic Himalayan Committee.

III. Science and Success

However, by the time Hunt replaced Shipton in late October/November 1952 all the fundamental problems of the last 1000 feet had been solved, the equipment was in place and Griff Pugh was appointed Expedition Physiologist. Others of like mind – Tom Bourdillon, Charles Evans, and myself – perfectly understood the disciplines required to ensure success. Barring acts of God such as avalanche and extreme weather we should prevail.

Our advantageous position had a long history not only in mountaineering but also in understanding the transport system of oxygen in the body, the development of anaesthesia and the development of cardiac and lung surgery. Although supplementary oxygen had been used sporadically on most Everest expeditions, including the failed Swiss attempt in 1952, it did not appear to provide the necessary improvement in performance, although knowledgeable high-altitude physiologists like Joseph Barcroft of Cambridge were adamant that it should be used following the Italian balloon tragedy in 1875. Bryan Mathews, also Professor of Physiology at Cambridge, had shown that the greatly increased respiration at altitude would lead to considerable heat loss from the lungs and contribute to the high incidence of cold injury.

Additional information came from North America, where in 1946 C.S. Houston and R.L. Riley had carried out a decompression chamber experiment at Pensacola Naval Air Base, Florida. Volunteers had, after thirty days acclimatisation, managed to reach the 'summit of Everest' but whether possible on the ground given all the extra climatic and other stresses, which needed a higher oxygen intake, was not proven. This experiment, together with the inability of pre-War climbers to ascend fast enough relying on acclimatisation alone resulted in the M.R.C.'s

insistence on the 'supplementary oxygen' option in 1953.

The final medical solutions included increasing the rate of supplementary oxygen uptake to four litres per minute rather than two litres per minute to boost rate of ascent and to increase heat production; the use of sleeping oxygen to combat altitude deterioration; the necessity of drinking two to three litres of fluid every day to combat dehydration and adequate food intake despite a natural disinclination to maintain both the latter requirements. Adequate clothing and the use of down jackets was a vast bonus over the multiple layers of sweaters previously used. Because the Nepalese approach did not allow for adequate acclimatisation, as did the northern Tibetan route, which crossed the plateau at 16-17,000 ft, it was decided very early on by Pugh that an acclimatisation period to get mountaineers fit was necessary before any attempt on the Ice Fall.

At the same time in 1952 a very strong, well acclimatised and well organised Swiss party composed mainly of climbers belonging to a Geneva Club, L'Androsace, made their attempt on Everest. Being able to climb in both Winter and Summer on peaks up to 16,000 feet, many being professional guides and so more experienced and better climbers than any party of British climbers, nevertheless failed to summit because 'they got the science wrong'. Their oxygen sets did not provide adequate flow rates and lack of adequate fluid intake resulting in excessive dehydration caused undue fatigue. Despite this Lambert and Tenzing got to within 500 feet of the summit.

So it was that in May 1953 we were poised after thirty years of failure and it was to be another twenty-five years before Everest was climbed without supplementary oxygen. The first summit attempt by R.C. Evans and T.D. Bourdillon relied on the use of closed circuit oxygen sets in which low flow rates of oxygen are used and then exhaled carbon dioxide is absorbed in a soda lime cannister and the oxygen re-cycled – hence the term closed circuit. Its advantages are that the climber is at sea level in the depths of his lungs and he

can climb at sea level rates. But the set is heavy and if it breaks down the climber at one moment at 'sea level' is suddenly exposed to the altitude at which he is climbing with possible loss of consciousness. The open circuit used by the support parties and Hillary and Tenzing was simpler, rugged and less likely to break down. Oxygen at varying flow rates which determines the altitude in the depths of the lungs is inhaled and exhaled air is vented to the atmosphere.

Hunt's plan was faulty. He decided the first attempt was to climb to the summit from the South Col (26,000 feet), an ascent of 3,000 feet and descend the same day. In the opinion of many including myself as expedition doctor this was too risky given that the closed circuit sets were not foolproof and a high camp at 28,000 feet was to be provided in any event for the second assault party of Hillary and Tenzing. A high camp should have been available for the first attempt on safety grounds and to give them optimum conditions.

Hunt, however, remained intransigent and refused to change his mind – not the first time that his mountaineering judgement was questionable. In the event Evans and Bourdillon reached the South Summit (28,750 feet) but, because their sets malfunctioned, decided to go no further. On return to the South Col Bourdillon became semi-conscious because his set suddenly failed. If they had been provided with a high camp I believe they could have succeeded.

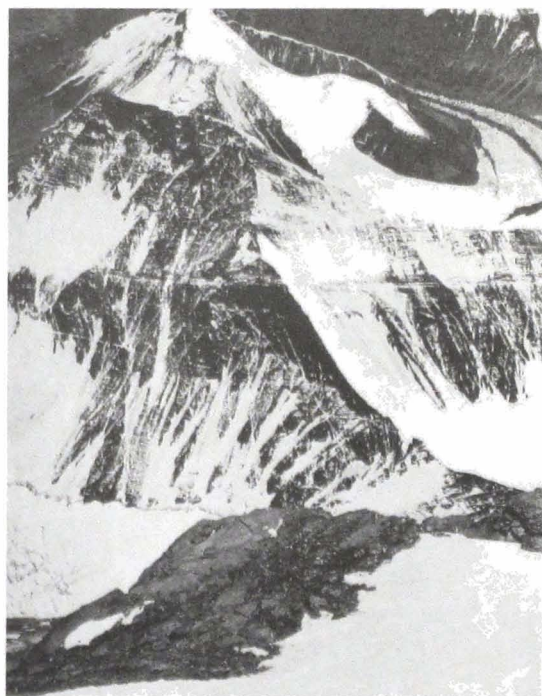
The second party of Hillary and Tenzing were able to use the High Camp and it demonstrated how fit they were; and their support group of Lowe, Gregory and Ang Nima using the open circuit sets, were each able to climb to 28,000 feet carrying up to 60 lbs.

On the night of May 28th 1953 a temperature of -27°C was recorded, much the same as that on the South Col. After a sleepless night spent melting snow for water and using sleeping oxygen intermittently, Hillary and Tenzing reached the South Summit at 9 a.m. From here the main obstacle between them and the summit was a rock step twenty to thirty feet high now known at the Hillary

Step. Luckily between the rock and the snow a gap had opened up which allowed them to chimney up to the final ridge. They reached the summit, a snow cap, at 11.30 a.m. and they removed their oxygen masks for a short period, knowing it was safe from the 1946 American work. Photos were taken down all the main ridges, the most poignant view being of the North Col from which so many expeditions had tried and failed to reach the summit. All the surrounding peaks were shrunk and flattened being 1000 feet beneath them. They left at 11.45 a.m. after replacing their masks, and reached the South Col in the early evening. Hillary's first laconic words to Lowe, his New Zealand climbing partner, who met them on the Col were 'we knocked the bastard off'.

IV. The Legacy of Everest

The legacy of Everest is huge. All the World's highest peaks have now been repeatedly climbed by their original and more difficult routes, and the exploration of the mountain ranges of Asia has increased, whilst mapping has become more sophisticated. The development of High Altitude Medicine and



Everest 1953: Photo taken from the summit looking down the north, Tibetan, side to the North Col.

Photo: Courtesy of Michael Ward.

Physiology as a specialty is increasingly taught in Universities in North and South America and China and the fit young climber at altitude is also a model for those at sea level with chronic heart and lung disease whose oxygen transport system is compromised.

In 1978 Messner and Habeler climbed Everest from the south without supplementary oxygen. A feat made possible by intensive training, great athletic ability and supreme efficiency of technique. A few years later Messner alone repeated this feat from the North. The fittest and best mountaineers will continue to take their sport to extreme limits unimaginable in 1953. But the main legacy of Everest extends beyond mountaineering, for the knowledge needed to make the first ascent has expanded vastly and benefited the 150 million people who live above 10,000 feet, protected those who travel, ski

and climb at altitude and has helped us all in our understanding of man and the natural world.

Michael Ward, C.B.E., M.D., F.R.C.S.
(m. 1943)

Mr Ward is Emeritus Consultant Surgeon to the City and East London Area Health Authority (Teaching). He was a Consultant Surgeon from 1964 to 1993 and a Lecturer in Clinical Surgery at the London Hospital Medical College from 1975 to 1993. He has published extensively on high-altitude medicine and mountaineering; and his latest book has just appeared: Everest: A Thousand Years of Exploration (Ernest Press: Glasgow, 2003). Copies can be ordered, post free, only from the Ernest Press, 17 Carleton Drive, Glasgow, G46 6AQ (www.ernest-press.co.uk).



1953: Everest Team a few days after the first ascent on May 29th. Left W.F. Noyce, Dr F. Gregory, L.E.C.F. Pugh, G.C. Band, T.D. Bourdillon, M.P. Ward, W.G. Lowe, Tenzing Norgay, H.J.C. Hunt, E.P. Hillary, C.G. Wylie, R.C. Evans, Dawa Tenzing, T.D. Stobart and many Sherpas.

Photo: Courtesy of Michael Ward.