142. Watercolour by Walter Hood Fitch, c1850, based on Hooker's observations from Choonjerma pass. (*Courtesy of Royal Botanic Gardens, Kew*)

eller, it is the sense of traversing a rough moorland balcony, crags to the east and wooded valleys and distant peaks to the west, which is strongest.

Hooker's impressions of the scene were captured in a watercolour (above) by Walter Hood Fitch, the botanical artist who illustrated Hooker's writings. Believed to have been painted in 1850, it captions the view as from the Choonjerma pass and the height as '16,000 ft', which seems a bit high, but gives no information on the distant peaks.

The watercolour appears to include Makalu and the Everest group, though it would be another two years (1852) before Radhanath Sikhdar, the Bengali chief computer, rushed into the office of the surveyor general of India and declared he had 'discovered the highest mountain in the world', and 15 years before the name 'Everest' was adopted by the Royal Geographical Society.

Hooker was director of Kew between 1865 and 1885, and it was there, at the end of 2010, that a documentary filmmaker, Peter Donaldson, unearthed Hooker's Choonjerma sketch and its significance was realised. Written above Makalu and the Everest group are the words 'very high snows WNW'. These are presumably the same peaks he writes of in his journal as being 'a little to the north of west'.

Whilst it is possible earlier illustrations or sketches may exist, attempts by Kew's illustration team to locate anything have been fruitless. Professor Stephen Hopper, Director of the Royal Botanic Gardens, said: 'We have a vast collection of illustrations here at Kew and curation is an ongoing job. It is always wonderful when we turn up a hidden gem of such historical importance. To our knowledge there are no other earlier representations of Everest by a European, in which case, this discovery could be one of the most important findings in Kew's archive.'

GEORGE RODWAY & JEREMY WINDSOR

Ama Dablam – 50 Years On

March 2011 saw the 50th anniversary of the first ascent of Ama Dablam. The ascent via the south-west ridge by Bishop, Gill, Romanes and Ward arguably marked the beginnings of technical alpinism in the Himalaya. However, in the years since, hundreds of mountaineers have reached the summit and the route is now regularly climbed by commercial expeditions using fixed ropes and the support of Sherpas. Ama Dablam's reputation today as a trade peak stands in stark contrast to the perception of those who first tried to climb it.

143. The 'Silver Hut' (at 5800 m) with Ama Dablam in the background. The south-west ridge route is roughly up the left-hand skyline. (*Courtesy of Jim Milledge*)

Until Michael Kennedy's excellent article on Ama Dablam in *Alpinist* no. 10,[1] it would have been all too easy to overlook the unique early history of this striking peak. Set in the heart of the Solu Khumbu region of Nepal, Ama Dablam first came to the attention of western mountaineers in the early 1950s as they essayed a route to the south flank of Everest. In his book *Summit: 150 Years of the Alpine Club*,[2] George Band recalls New Zealander George Lowe commenting during the 1953 Everest expedition, 'that peak [Ama Dablam] will never be climbed' (p.168). This was a reasonable prediction given what was to follow a few years later. The

144. Long telephoto from near Tengboche showing two ropes of two (Gill, Romanes, Ward, and Bishop) on summit fluting of Ama Dablam, 13 March 1961. (*Courtesy of Mike Gill*)

peak's first attempt in the October of 1958 was by a British-Italian team led by Alfred Gregory. The climbers found the difficulties of the SW ridge and the growing cold of autumn a severe challenge:

> *After extremely difficult climbing the attempt was abandoned at about 20,000 ft. [~6100 m] due to great technical difficulties of steep rock and ice. Following this a journey was made around the mountain and all ridges and possible routes examined. We found no feasible way of climbing the mountain; with the weather becoming increasingly cold, all idea of climbing this very difficult peak was given up.*[3]

Despite Gregory's verdict, just a few months later, in May 1959, another British-led attempt chose the mountain's north-east spur and north ridge as their objective. Close scrutiny of photographs showed that this possible route levelled out in the last part of the climb, and the last 300m or so of ascent appeared to be at a relatively easy angle.[4] The team made astonishing progress on a route significantly more difficult than the south-west ridge and very nearly succeeded in making the first ascent. However, tragedy struck when Michael Harris and George Fraser disappeared high above their 6400m camp as they neared the easier summit slopes. The north ridge would not be climbed in its entirety until 1979.

The first ascent of Ama Dablam in 1961 had unusual beginnings. Rather than travelling to Nepal with a mountain already in their sights, the first

ascensionists arrived as members of the highly ambitious 1960/61 Himalayan Scientific and Mountaineering Expedition. Led by Sir Edmund Hillary, the expedition had several objectives. During the autumn months of 1960 Hillary accompanied a party in search of the yeti before eventually returning the following spring to make an attempt, *sans* supplemental oxygen, on Makalu (8463m). In the intervening months, leadership of the expedition passed to Griffith Pugh, a physiologist based at the Medical Research Council's laboratories in London. Pugh, with a small party of scientists, oversaw a set of human physiology experiments that would become the 'gold standard' for high altitude field studies.

The site of the laboratory could not have been more extraordinary. At 5800m on the Rakpa glacier, close to the head of the Mingbo valley and the south-west ridge of Ama Dablam, a small cylindrical prefabricated 'Silver Hut' just 6.7m long and 3m wide was erected. This structure had been designed and built in the UK from marine plywood containing 8cm of plastic foam insulation, and each section could be conveniently carried as a porter load.[5] Mike Gill, one of the participants and the only surviving member of the first ascent party, wrote to one of the authors recently:

> *We were in the unusual position of living and working … in the Silver Hut at the head of the Mingbo which meant that we just took days off work when we could be spared – not the usual assault mode where climbers are either at base camp or above. You could say that the Silver Hut was our base camp!*

Over the course of the long winter months, Pugh and his colleagues, with the aid of some of the most sophisticated research tools then available, painstakingly recorded the subtle changes that occurred to the body's organs at high altitude. Whilst the impact of altitude on the heart and lungs occupied the vast majority of their time and energies, it was the studies performed on a single research subject that provided Pugh with what some would argue were his most astonishing results.[6]

On a cold January evening, a 35-year-old Nepali called Man Bahadur arrived at the foot of the glacier and asked if he could stay to complete a religious pilgrimage to the mountains. He was dressed only in thin cotton clothes and a large turban. The group urged him to descend to the warmth and safety of the valley far below. Ignoring their advice, Man slept close to the Silver Hut for four nights, enduring temperatures as low as –15°C without the benefit of shoes, gloves or shelter of any kind. The expedition members were so impressed by this that they allowed him to stay and sensing that this was someone special, Pugh persuaded him to take part in a series of studies. For the first experiment, Man was crisscrossed with 11 temperature probes and sat on a canvas chair whilst his bare feet were rested on a sheepskin rug. At temperatures hovering around zero C the pilgrim sat patiently for three hours whilst Pugh looked on shivering in his thick down suit. The results were startling – the subject's core temperature remained unchanged and his average skin temperature fell by only

3°C. Jim Milledge, a scientist who stayed in the Silver Hut throughout the winter of 1960-61 recalled many years later:

It was amazing. It [the cold] didn't shut down his periphery, as it would for you or I. He kept his skin temperature just above freezing and he didn't have violent shivering. He just had a very slight shiver, like a dog shivers, and that seemed to be enough to keep his metabolic rate up and keep him warm.[7]

In the second experiment Pugh made a series of measurements with a sophisticated gas analyzer in order to measure the pilgrim's metabolic rate. The findings were most notable. Sitting almost motionless, Man was able to almost triple his metabolic rate and generate enormous amounts of heat in the process. Normally, such a feat would only be possible with a painful degree of shivering. Man had instead found a different way to keep warm, and to this day it is still not totally clear to scientists how this extraordinary physiological act was accomplished. Whilst Pugh and his team resumed their planned experiments, the mountaineers amongst them became increasingly distracted. After several months studying the mountain, a possible route was finally identified:

At first we had hoped there might be an unseen easy way around the back but in this we were disappointed. Then one day it dawned on us that the obvious route was directly up the front of the mountain, up the Mingbo (SW) Ridge and the fluted snow-face that we had been gazing at ever since we arrived in the Khumbu [virtually adjacent to the Silver Hut – see photo].[8]

Slowly, plans for a serious reconnaissance of the south-west ridge were hatched. On 18 February, a break in the research finally arrived and a close inspection was begun. The climbing team was composed of New Zealanders Mike Gill and Wally Romanes, American Barry Bishop, and Englishman Mike Ward. Jim Milledge, who had made the first ascent of nearby Puma Dablam (6340 m) a few weeks before, related later:

We all felt that the chances of success were small. However, over the next three weeks they worked their way slowly along the knife-edge ridge, over rock towers, to the snow and ice section. We were able to follow their progress by watching them through the telescope and by radio contacts. On March 13, all four reached the summit.[5]

Milledge's early pessimism was well founded. No sooner had Ward and his team established Camp 1 than a series of difficult obstacles were encountered. A 'gully with an overhang' and, 'a series of ragged and jagged turrets', needed to be overcome before the foot of the steep and intimidating Yellow Tower was eventually reached.[9] Here, faded nylon ropes marked the high point that John Cunningham had reached two and a half years before with Gregory's team. However, using a combination of aid and free tactics, the tower was quickly climbed and a series of ropes and wire ladders were fixed amongst the overhanging rock. Ward was impressed with the route, writing later:

Ama Dablam seemed to be a mountain of Alpine calibre; the route…providing climbing of every variety. By and large the difficulties had to be overcome rather than avoided, and there were sections of artificial rock and artificial ice climbing.[9]

Beyond the Second Step the route quickly changed. The rotten sections of steep rock that had characterised the lower part of the ridge were now replaced by a series of towers smothered in loose snow and a series of smooth icy walls. Nonetheless, after almost three weeks on the mountain, the four climbers finally gathered at the foot of the snowfield that masked the mountain's south face. Stretching for almost 500m, this was to prove the final obstacle. From the vantage point of their snow cave the team was able to trace out a series of flutings that offered a safe way to the summit. Fortunately, snow conditions were perfect and they took little more than six hours to reach the summit. The mountain had finally relented. In recognition of Mike Ward's leadership of this demanding climb – in many ways the vanguard for technical alpinism in the Himalaya (and a route not repeated until 1979) – Mike Gill wrote to the authors in August of 2010:

It really was Mike's climb. He saw the route, was the first to start climbing on it, and it was Mike who put the route up the first rock buttress which is the most technical part of the climb.

However, news of their success on the mountain was greeted with political outrage in Kathmandu. Nepal had recently instituted a peak permit/fee system and this ascent was made without 'official' government permission. Hillary had not been in Nepal during mid-winter, but when he returned late in the season to prepare for a spring attempt on Makalu, he was faced with an angry Nepalese government that was preparing to throw him and all of his expedition companions out of the country as an example to others. Hillary subsequently spent the next 10 days meeting with countless officials and government ministers in an attempt to limit the fallout. In the end his powers of diplomacy reigned supreme, and he escaped with a number of stern lectures and a fine equivalent to about US $60.[10]

Lest we forget the primary reason why these mountaineers/scientists spent numerous winter months in the Khumbu, Jim Milledge provides a summing-up some of the most valuable scientific observations from the work in and around the Silver Hut:

I suppose the overall statements that we could make about the limits of long-term [altitude] residence [were very important]… 5800m [the Silver Hut altitude] is certainly too high to acclimatise in the long term…now we say if you want to have super acclimatisation the thing is to go and live somewhere around

145. Mike Gill, Wally Romanes, Mike Ward, and Barry Bishop (L–R) on summit of Ama Dablam, March 13, 1961 (*Courtesy of Mike Gill*)

4000-4500m with frequent trips to higher altitude to boost acclimatisation – but spending most of the time below 5000m.[7]

Milledge also suggested that the work done on the distinctive breathing differences between Sherpas and the scientists shed important light on human physiological variation in those native to low altitude vs. those native to high altitude.[7] The finding that the Sherpas have a much lower ventilatory (breathing) response to hypoxia led Milledge and a colleague to conduct an in-depth study of this (and other) phenomena in the Khumbu just a few years later.[11] These important physiological findings would be integral to shaping acclimatisation strategy and climbing tactics for high altitude mountaineering in the following decades.

The 1960-61 Himalayan Scientific and Mountaineering Expedition was unique. Not only did Griffith Pugh and his scientific colleagues complete some of the most important research ever undertaken at high altitude, but a few of the mountaineers in the group successfully climbed a difficult virgin peak in a bold and imaginative style. For scientists and mountaineers alike, this expedition most certainly set a high standard for all others to follow.

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Mallory on The Ben

At Easter 1906, during his first year at Magdalene College, Cambridge, George Mallory went climbing on Ben Nevis. He had two companions: Graham Irving, the schoolmaster who introduced him to climbing at Winchester; and Guy Leach, another former Winchester pupil who was at New College, Oxford. The three men spent 10 days in Fort William, where they lodged at St Andrew's Choir School. They went on to the Ben five times, during which, apart from a distant sighting of a couple in Allt a' Mhuillin glen, they had the mountain to themselves. The Ben was in full winter condition and they climbed five routes, culminating in the second winter ascent of North-east Buttress, first climbed by Naismith and others 10 years before.

The Ben Nevis excursion is significant in the Mallory story, since it was his first full climbing trip in the British Isles. (He was aged 19 at the time; Leach was 20, Irving 29.) Yet it has, until now, escaped the notice of Mallory biographers, including this one. In *The Wildest Dream*, written with my wife Leni, we asserted that Mallory's first British climbing was undertaken in Snowdonia in September 1907, in the company of Geoffrey Keynes and Hugh Wilson. Mallory's five days on the Ben, which predate the Snowdonia trip by 17 months, have come to light thanks to the resurfacing of the Book of Minutes of the Winchester Ice Club. The club was formed by Irving at Winchester in 1904 and the minutes were used to record its visits to the Alps. The 1904 and 1905 accounts include written contributions by Mallory himself. Irving wrote the entire account of the 1906 Ben Nevis expedition, filling 57 pages of Volume Two (there are six volumes in all).

For a long time the whereabouts of the minutes was a mystery. They had been purchased from a dealer in 1967 by a US collector, Wilbur Smith, who had them rebound and planned to publish them. But the project foundered and Smith died in 1988. In 2009, a firm of solicitors found the bound volumes in their archives, and passed them to the Alpine Club Library.

Irving's record of the Ben Nevis trip thus fills a gap in the roster of Mallory's climbs. His account is revealing in other ways. Mallory's energy and enthusiasm shine through, speaking of the character that was to be demonstrated on Everest two decades on. There is also an ingenuous quality about Irving's description of their visit to 'the greatest of our British mountains' that is both appealing and surprising, for he appears unaware of the activities of Scottish Mountaineering Club members in the preceding decade.

The SMC was founded in 1889 and started publishing its journal in