A M Kellas: Pioneer Himalayan Physiologist and Mountaineer

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(*Plate* 94)

A M Kellas (1868–1921) has a special place in the early history of climbing Mt Everest, but his contributions have not been fully appreciated. First, he was an indefatigable Himalayan explorer; when the 1921 Reconnaissance Expedition was being planned, he probably knew more about the physical approaches to Everest than anybody else. But Kellas also excelled in another area: in 1920 he had almost certainly given more serious thought than anyone to the physiological challenge of the immense altitude of Everest.

In spite of these two special attributes, relatively little has been written concerning Kellas. Apart from a few obituaries which appeared immediately after his death, the only extensive article about his mountaineering achievements was one in German in 1935 which is not easily accessible.[1] Recently, a paper on his physiological contributions was published in an American physiological journal.[2] In the present article, I hope to show why Kellas deserves more attention.

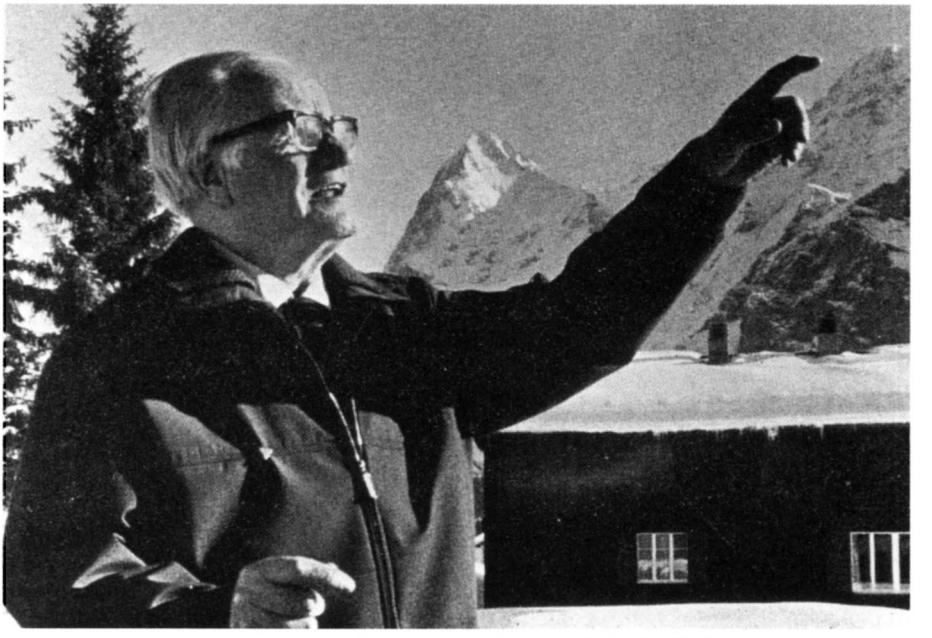
A good place to start is the meeting of the Royal Geographical Society on 18 May 1916, when Kellas delivered a paper entitled 'A consideration of the possibility of ascending the loftier Himalaya.' A R Hinks, Secretary of the Society, had written to Kellas as follows, inviting him to prepare the lecture: 'If you could give us a paper with some general title like "The possibilities of climbing above 25,000 feet" it would be a subject of first-rate interest . . . especially since no one perhaps in the world combines your enterprise as a mountaineer and your knowledge of physiology.'[3] Hinks was remarkably perceptive. Indeed, Kellas was probably unique in his knowledge of the physical problems of approaching Mt Everest, and of the physiological difficulties of climbing at these enormous altitudes.

Alexander Mitchell Kellas was born in Aberdeen on 21 June 1868. His father, James Fowler Kellas, was Secretary and Superintendent of the Mercantile Marine Company in Aberdeen and married Mary Boyd Mitchell. There were nine children, of whom Alexander was the second. One of his brothers, Henry, was a lawyer in Aberdeen and looked after Alexander's affairs when he was abroad. Alexander never married but Henry had four children, two of whom are still alive; one, A R H Kellas, was British Ambassador to Nepal from 1966 to 1970.

A M Kellas was educated at Aberdeen Grammar School and at the University and Heriot-Watt College in Edinburgh. He then moved to University College London, where for a time he was a research assistant to Sir William



94. *A M Kellas (1862–1921).* (p 207)



95. *Sir Arnold Lunn in Mürren, 1974.* (p 214)

Ramsay. He later went to Heidelberg University, where he obtained his PhD degree in 1897. In 1900 he was appointed Lecturer in Chemistry at the Middlesex Hospital Medical School in London, and he held that appointment until 1919.

Kellas began hill-walking when he was young, first in the Grampians and later in Wales and on the Continent. In 1907 he made his first expedition to the Himalaya, spending the months from August to October climbing first in Kashmir and later in Sikkim. There followed a remarkable series of climbs in the summers of 1909, 1911, 1912, 1913, 1914, 1920, and the early spring of 1921. The period between 1914 and 1918 was ruled out because of the war; however, we know that Kellas planned expeditions to Sikkim for both 1915 and 1916 because a typewritten proposal for these still exists.

Table 1. Kellas's Expeditions to the Himalaya

1907	Kashmir: Pir-Panjal range
August–October	Sikkim: Zemul glacier, Grunsee, Simvu (6816m, unsuccessful) (*AJ*34, 408)
1909	Sikkim: Pauhunri (7065m, unsuccessful), Jongsong
August–October	La (6120m), Langpo (6950m), Jongsong Peak (7459m, unsuccessful) (*AJ*34, 408)
1911	Sikkim: Sentinel Peak (6470m), Pauhunri (7065m),
April–August	Chomiomo (6835m), Dhanarau Peak (5790m) (*AJ*26, 52,113; *GJ*40,241)
1912	Sikkim: Kangchenjhau (6920m) (*AJ*27,125)
July–September	
1913	Kashmir: explored access to Nanga Parbat via branch
Summer	of Ganalo Peak (little information available)
1914	Garhwal: approaches to Kamet (little information
Summer	available)
1920	Garhwal: Kamet (7755m, unsuccessful by 500m)
August–December	Sikkim: Kang La (*AJ*33,312; *GJ*57,124, 213)
(with Morshead)	
1921	Sikkim: Kabru (7338m, unsuccessful)
Early spring	Start of Everest Reconnaissance Expedition
May	

(*AJ*: *Alpine Journal*; *GJ*: *Geographical Journal*)

Table 1 summarizes some of the regions and peaks explored by these expeditions. Notable first ascents included Langpo (6950m), Pauhunri (7065m), Chomiomo (6835m) and Kangchenjhau (6920m). Kellas was not a prolific writer, but accounts of most of his expeditions were published in the *Alpine Journal* and the *Geographical Journal*. Very little information is available about the expeditions of 1913 and 1914.

Kellas usually climbed alone, accompanied only by some native porters. An exception was in 1907 when he was accompanied by two Swiss guides, but this was not a success because they were badly affected by mountain sickness. It was not until 1920 that he chose another companion, Major H T Morshead. Kellas is credited with being the first Himalayan explorer to recognize the great value of the Sherpas. He stated that one of the purposes of his attempt on Kabru in the early spring of 1921 was to train Sherpas for the forthcoming Everest reconnaissance.

It is remarkable that Kellas, a full-time member of the Middlesex Hospital Medical School until 1919, was able to find time for this extensive series of Himalayan expeditions. On every expedition he must have been away from London for some four to five months, counting the time taken to sail to India and back. Nevertheless, he was described as a conscientious staff member and a good teacher.

Kellas must have been exceptionally tough to withstand the rigours of these small expeditions to great altitudes, although his appearance did not suggest this. Mallory described him in a letter to his wife during the early stages of the 1921 Everest Reconnaissance thus:

> Kellas I love already. He is beyond description Scotch and uncouth in his speech – altogether uncouth. He arrived at the great dinner party ten minutes after we had sat down, and very dishevelled, having walked in from Grom, a little place four miles away. His appearance would form an admirable model to the stage for a farcical representation of an alchemist. He is very slight in build, short, thin, stooping and narrow-chested; his head . . . made grotesque by veritable gig-lamps of spectacles and a long pointed moustache. He is an absolutely devoted and disinterested person.[4]

Kellas gradually became increasingly interested in the physiology of extreme altitude, which is not surprising given his scientific background and his great personal experience. It is believed that he probably made more ascents over 20,000ft (6100m) than any of his contemporaries. The early part of this century was a colourful period in the physiology of extreme altitude. In the late 19th century, many people believed that it would be impossible to climb above about 21,500ft (6500m).

T W Hinchliff, President of the Alpine Club, wrote in 1876 after a visit to Santiago as follows:

> I could not repress a strange feeling as I looked at Tupungato (21,550 feet) and Aconcagua (23,080 feet) and reflected that endless successions of men must in all probability be forever debarred from their lofty crests . . . Those who, like Major Godwin-Austen, have had all the advantages of experience and acclimatization to aid them in attacks upon the higher Himalaya agree that 21,500 feet is near the limit at which man ceases to be capable of the slightest further exertion.[5]

However, in 1909 the Duke of the Abruzzi reached an altitude of 7500m

without supplementary oxygen on Chogolisa in the Karakoram. This feat astonished climbers and physiologists alike. The Duke's biographer, de Filippi, remarked that the expedition was designed 'to contribute to the solution of the problem as to the greatest height to which man may attain in mountain climbing'. Kellas became interested in the factors limiting man's performance at extreme altitudes and the causes of mountain sickness, though he himself seems to have been remarkably unaffected by great altitudes. In 1917 he wrote a tentative proposal for a medical scientific expedition to remain for several months at an altitude of 20,000ft (6100m) in order to study the physiology of acclimatization. He even suggested that it might be possible to carry the parts of a small wooden hut to the summit of Kangchenjhau (6920m) to use as a laboratory. This proposal could be considered the forerunner of the Himalayan Scientific and Mountaineering Expedition of 1960–1961.

In 1918 Kellas collaborated with the eminent physiologist J S Haldane on a study of acclimatization over three days in a low-pressure chamber at the Lister Institute in London.

From a physiological point of view, the most remarkable contributions made by Kellas were in an unpublished manuscript entitled 'A consideration of the possibility of ascending Mt Everest.' This was apparently finished in the summer of 1920 just before he left for another Himalayan expedition, and he never returned to England. Two copies of the manuscript are extant – one in the archives of the Alpine Club and the other in those of the Royal Geographical Society. The two manuscripts are very similar, though not identical; the Alpine Club version appears to be slightly later, with more notes and corrections.

A French translation of the manuscript was published in a very obscure place, the Proceedings of the *Congrès de l'Alpinisme* held in Monaco in 1920.[6] Kellas may have presented the paper at this meeting when he was *en route* to India, but this is not certain.

Kellas began by stating his main question: 'Is it possible for man to reach the summit of Mount Everest without adventitious aids [by which he meant supplementary oxygen] and if not, does an ascent with oxygen appear to be feasible?' He divided the problems to be overcome into two groups: 'I. Physical difficulties' and 'II. Physiological difficulties', and he considered each of these at some length.

It would be inappropriate to go into the details of Kellas's physiological studies here. The importance of his work was not that he obtained the correct answers to many of the questions that he asked; in fact he did, but this was in part by chance because he had so few data. The importance of his work was that he asked all the right questions, and indeed his probing of the important factors to be considered showed great insight.

Among the factors that he discussed were the altitude and barometric pressure of the Everest summit, the composition of the air in the lungs of a climber near the summit, the amount of oxygen in his blood, the maximal rate at which oxygen could be consumed by the body and the greatest ascent rate near the summit. His predictions for the last two were remarkably accurate. For example, he calculated that the maximal rate of oxygen consumption of a climber near the summit would be a little less than one litre per minute; the

currently accepted value is only just above this. Again, he calculated a maximal climbing rate near the summit of 300–350ft per hour; this agrees well with calculations based on the maximal oxygen consumption and Messner's account of his first ascent without supplementary oxygen. Messner stated that 'The last 100 metres of height took us more than an hour to climb.'[7]

The last few lines of Kellas's manuscript are under the heading 'General Conclusion': 'Mt Everest could be ascended by a man of excellent physical and mental constitution in first-rate training, without adventitious aids if the physical difficulties of the mountain are not too great, and with the use of oxygen even if the mountain can be classed as difficult from the climbing point of view.' It took 58 years for his prediction of an ascent without supplementary oxygen to be proved true!

Six days after Kellas posted a copy of this manuscript to the Secretary of the Royal Geographical Society, he left for India never to return. The circumstances of his death make a poignant story.

Kellas was apparently under a great deal of strain during his last years as lecturer at the Middlesex Hospital Medical School. In a letter to Hinks, dated 21 October 1919, he referred to 'a peculiar and continuous annoyance . . . a disturbance which medical men tell me is due to overwork and which takes the form of malevolent aural communications, including threats of murder'.[8] This suggests incipient mental illness and was the reason why Kellas resigned his position. There is no other mention of this problem in Kellas's correspondence with Hinks, but Kellas told the well-known biologist J B S Haldane (son of J S Haldane) about his auditory hallucinations, and Haldane mentioned these at a high-altitude symposium: 'Some people hear voices at high altitudes. Dr Kellas also heard them at sea-level. Indeed he once told me that he wondered if a very sensitive microphone might not render them audible to others.'[9]

In 1920 Kellas nevertheless carried out an extensive climbing programme from August to December with H T Morshead, and since he had resigned from his job he remained in Darjeeling during the winter. While he was there he received an invitation to take part in the 1921 Everest Reconnaissance Expedition. This naturally elated him greatly, since he had spent much of the previous 15 years exploring the approaches to the mountain from the west and north. However, he was back climbing on Kabru in the early spring of 1921, and he wrote to Hinks that his main object was 'to obtain for your use a photograph of Mt Everest and all the peaks to the NW . . .'[10] He returned to Darjeeling from Kabru on 10 May, which only gave him nine days' rest before starting on the Everest Reconnaissance Expedition.

The trek from Darjeeling went north through the humid jungle of Sikkim and crossed into Tibet over the Jelep La. Kellas, who was almost 53 years old, became ill with severe diarrhoea and was so weakened that he had to be carried on an improvised stretcher. Mallory wrote to a friend:

> The most tragic and distressing fact about his death is that no one of us was with him. Can you imagine anything less like a mountaineering party? It was an arrangement which made me very unhappy, and which appals me now in the light of what has

> happened. And yet it was a difficult position. The old gentleman (such he seemed) was obliged to retire a number of times *en route* and could not bear to be seen in this distress, and so insisted that everyone should be in front of him.[11]

Kellas died as the expedition approached the Tibetan village of Kampa Dzong. It was here that the expedition members had their first view of Everest. Mallory wrote:

> It was a perfect early morning as we plodded up the barren slopes above our camp . . . ; we had mounted perhaps a thousand feet when we stayed and turned, and saw what we came to see. There was no mistaking the two great peaks in the west: that to the left must be Makalu, grey, severe and yet distinctly graceful, and the other away to the right – who could doubt its identity? It was a prodigious white fang excrescent from the jaw of the world.[12]

Kellas was buried on a hillside south of the village in a place which looks out across the arid Tibetan plain to the distant snows of the Himalaya where there rose the three peaks of Pauhunri, Kangchenjhau, and Chomiomo, which Kellas alone had climbed. Mallory described the scene to Geoffrey Winthrop Young:

> It was an extraordinarily affecting little ceremony burying Kellas on a stony hillside – a place on the edge of a great plain & looking across it to the 3 great snow peaks of his conquest. I shan't easily forget the 4 boys, his own trained mountainmen, children of nature seated in wonder on a great stone near the grave while Bury read out the passage from the Corinthians.[13]

So Kellas, who had spent much of the last 15 years of his life studying the physical and physiological problems of climbing Mt Everest, and who probably knew more about these subjects than anyone else alive, died just as the first reconnaissance expedition had its first view of the mountain they came to climb. It would be difficult to imagine a more moving end to the life of this remarkable man.

ACKNOWLEDGEMENTS

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