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The G I Finch Controversy of 1921-1924

New physiological and medical insights

The 50th anniversary of the first ascent of Everest in 1953 has prompted a renewal of interest in the early expeditions to Everest. One of the strangest stories of the first three expeditions, in 1921, 1922 and 1924, was the controversy surrounding George Ingle Finch (1888-1970).

In 1919, shortly before permission was given by the Tibetan authorities for the first British Everest expedition, J P Farrar, President of the Club, consulted many mountaineers and concluded that George Finch and his brother Maxwell were the strongest climbers for the summit party. Then, early in 1921, the design of oxygen equipment for climbing at extreme altitudes was discussed at length and Finch took a leading role. This was natural because he was a well-trained physical chemist with a special interest in gases and none of the other climbers had these skills. But most remarkable of all, when Finch was studied in a high-altitude chamber in March 1921, he exhibited an extraordinary degree of fitness and tolerance to low oxygen. In fact a survey of the physiological literature to the present day shows that Finch's performance when acutely exposed to extreme simulated high altitude was almost unique, being equalled by only one other person, the Italian physiologist Margaria.

It would be natural to assume from all this that Finch would play a pivotal role in the first three Everest expeditions. However, this was not to be, in spite of the fact that during the 1922 expedition he and his companion Geoffrey Bruce attained the altitude record of 8320m, and in the process clearly demonstrated the enormous value of climbing oxygen. As expected, Finch was invited to join the 1921 expedition, but then amazingly the invitation was withdrawn because he was declared unfit only one week before his extraordinary demonstration of fitness in the low-pressure chamber. Even stranger was that after his record ascent during the 1922 expedition and his subsequently being asked to modify the oxygen sets for 1924, he was not invited to be a member of that expedition. The story is a fascinating one of personality conflicts with an outcome that was to the great disadvantage of everybody concerned.

Background of George Finch

Much has been written about Finch and we are particularly fortunate that his son-in-law, Scott Russell, prepared a detailed memoir which was included in the 1988 reprint of Finch's fine book *The Making of a Mountaineer*.

Briefly, George Finch was born in 1888 in Orange, New South Wales, then a small country town west of Sydney. He first became interested in climbing at the age of thirteen when he was entranced by the view of Orange from a nearby hill. The family moved to Europe when George was only fourteen and his mother, Laura, fell in love with Paris and decided to stay there while her husband Charles returned to Australia. It is said that he never saw his wife again. George's schooling presented something of a crisis. While it would have been natural for him to go to an English public school because the Finch family had strong links with Britain, Laura felt that the restrictions were too repressive and she arranged for George and his younger brother Maxwell to be privately tutored in Paris. Around this time George and his brother demonstrated their climbing initiative by scaling Beachy Head by a particularly dangerous route, and ascending the cathedral of Notre Dame in Paris.

George enrolled briefly at the *École de Médecine* in Paris but soon felt that he would be more comfortable in one of the physical sciences. At the suggestion of Laura's friend, Sir Oliver Lodge, George moved to the *Eidgenössische Technische Hochschule* (ETH) in Zurich where he studied from 1906 to 1911 with great academic success. He and his brother spent the weekends and vacations climbing in the Alps, and George became an outstanding mountaineer and president of the prestigious Zurich *Academischer Alpen Club*.

George returned to England in 1912 and soon became associated with the Imperial College of Science and Technology in London, which was to become his scientific base for the next forty years. During the Great War he served with the Royal Field Artillery in France, and also the Ordnance Corps, working on explosives in Salonica. He was awarded the military MBE, was mentioned in dispatches, and demobilised with the rank of captain. He married briefly in 1916 and there was a son, Peter Finch, who became the famous actor. After a divorce, a second marriage in 1921 was very happy and there were three daughters, one of whom, Anne, married Scott Russell.

Physiological studies

Early in the preparations for the 1921 expedition Finch became involved in improving the operation of Primus stoves at extreme altitude. In 1920, Kellas and Moreshead on Kamet had found that their Primus stove would not work above about 6100m. Finch and P J H Unna, a member of the Oxygen Subcommittee of the 1921 expedition, went to Oxford in March 1921 to see tests of the Primus stove in the low-pressure chamber in the laboratory of Georges Dreyer, the Professor of Pathology. Dreyer was originally from Copenhagen and his primary interest was in bacteriology. However, during the First World War he was a consultant to the Royal Flying Corps and became very knowledgeable about the effects of oxygen deprivation on

flying personnel. His design of oxygen equipment for aviators was a major advance and was widely used including in the USA.

The stoves were modified for high-altitude use and then Dreyer raised the issue of supplementary oxygen for climbers. He stated: 'I do not think you will get up [Everest] without it, but if you do succeed you may not get down again.' Finch visited Oxford again on 25 March together with Unna and Farrar, and Finch stayed in Oxford overnight so that Dreyer could carry out experiments on him in the high-altitude chamber the following day.

The results of these experiments clearly showed that Finch was outstandingly fit and furthermore that he had an extraordinary ability to exercise while acutely exposed to the severe oxygen deprivation of high altitude. Specifically, the altitude of the chamber was set at 6400m and Finch stepped up on a chair, first with one foot and then with the other, twenty times in succession while carrying a load of 16kg slung over his shoulder. The stepping rate was chosen to correspond to a fairly rapid climbing pace and he exercised in this way for two and a half minutes. Finch first carried out this task while breathing air, and then again while breathing oxygen. As expected, he tolerated the severe exercise much better with the oxygen, as evidenced by his better colour, ease of movement, lower pulse rate and slightly shorter time for the task.

The exceptional performance of Finch while breathing air is highlighted by the fact that there are almost no comparable experiments in the whole of the physiological literature to this day. The only similar study which has been reported is that of the Italian physiologist, Rodolfo Margaria in 1929 who studied three students aged 22 and himself aged 27 years in a low-pressure chamber at an altitude of 6500m while they exercised on a bicycle ergometer. However two of the students were unable to sit on the bicycle and ended up lying on the floor of the chamber, where their skin became pale, their lips were blue, and they lost consciousness. The third student was not studied at this altitude, and only Margaria was able to exercise under these conditions. In fact Margaria was able to work up to an altitude of 7000m, a feat that Finch equalled in another set of experiments in 1922. Incidentally, it is extremely unlikely that these experiments performed on Finch would be allowed under present guidelines for human investigations because of the dangers of the extremely severe oxygen deprivation.

Dreyer had carried out a substantial number of tests on the effects of oxygen lack on young men and it was quite clear to him that Finch's performance was outstanding. In a four-page letter to Farrar dated 28 March 1921 describing the experiments he stated: 'The tests in the low-pressure chamber proved that Captain Finch possesses quite unusual powers of resistance to the effects of high altitudes. Among the large number of picked, healthy, athletic young men we have examined, more than 1,000 in all, we have not come across a single case where the subject possessed the resistance power to the same degree.' The inescapable conclusion from all this is that

in March 1921 Finch was phenomenally fit and that his exercise ability at simulated extreme altitude was second to none in the published physiological literature to the present day.

Medical reports

We now come to the strangest chapter of the Finch story. The members of the 1921 expedition were required to have a routine medical examination and on 17 and 18 March, just one week before the low-pressure chamber experiments described above, Finch was examined by two Harley Street doctors. Amazingly they concluded that Finch was unfit and soon after this his invitation to join the expedition was withdrawn. The two medical reports still exist and make astonishing reading for someone with a medical training. The first by Dr H Graeme Anderson, a surgeon, is absurdly brief with vague statements such as 'Nutrition poor. Spare. Flabby.' and concludes: 'His physical condition at present is poor.' The second report by Dr F E Larkins, a physician (internist), is longer but includes no objective data on which to base his conclusion that 'This man is not at the moment fit.' There was a mild degree of anemia, often seen in athletes, and a single test suggesting that the urine contained sugar, a finding in diabetes. This test should have been repeated. Dreyer performed the same test a week later when the result was normal and when the test was repeated eight months later it was normal again.

An obvious omission from these two medical reports was any test of Finch's exercise ability. Fitness in the context of the 1921 expedition implies an ability to withstand the rigours of climbing, ideally under conditions of oxygen deprivation as is seen at high altitude. The two medical reports are essentially irrelevant in this context. By contrast, the outstanding performance of Finch in the low-pressure chamber just one week later is enormously convincing. There is a dramatic disparity between the medical reports and the physical performance of Finch, which raises the question of whether the reports were biased.

The decision to rescind Finch's invitation

The implication that the two medical reports were biased, and that Dreyer's report was intentionally suppressed, is a serious one and necessitates a closer look at how the decision to rescind Finch's invitation was reached. The make-up of the expedition was the responsibility of the Everest Committee which was formed by four members of the Royal Geographical Society (RGS) and four from the Alpine Club (AC). A R Hinks was the Secretary of the RGS and became the Secretary of the Everest Committee. The other three members from the RGS were Sir Francis Younghusband, Col E M Jack and Edward Somers-Cocks. From the AC there were J E C Eaton, Norman Collie, Capt J P Farrar and C F Meade.

It was quite reasonable for the Everest Committee to require that the members of the expedition should undergo a medical examination.

Presumably, the two doctors who examined Finch were selected by the official expedition doctor, A F R Wollaston. The choice of Wollaston as expedition doctor might be queried because his decision to study medicine was taken reluctantly and only so that he could take part in expeditions, as he stated himself. He once wrote to his father, 'medical practice as a means of a livelihood does not attract me – in fact I dislike it extremely'. On the other hand, it is true that Wollaston distinguished himself as a surgeon in the Royal Navy during the First World War when he was awarded a DSC.

Wollaston's choice of Graeme Anderson was reasonable because the latter had written the first book on the medical and surgical aspects of aviation and was knowledgeable about oxygen deprivation and the selection of aviators. Of course there is an obvious difference between a seated aviator and someone climbing at high altitude but very little was known about the medical selection of mountaineers at the time.

The choice of F E Larkins is curious because he was a paediatrician chiefly interested in the health of school children. It is possible that Wollaston asked Anderson to suggest a second doctor and he recommended Larkins. Both Anderson and Larkins had the same address and telephone number in Harley Street and presumably were partners in a practice. This raises the question of whether the two reports were really as independent as they should have been.

The reports themselves are clearly inadequate because their conclusions do not fit with the findings of the examinations. The only abnormal test was that for sugar in urine and, as indicated above, this was probably an error and should have been repeated. However, the most glaring inconsistency in the treatment of Finch is the enormous discrepancy between the results of the medical tests and Finch's extraordinary demonstration of fitness one week later in the low-pressure chamber. The results of these tests were sent by Dreyer to Farrar who was a member of the Everest Committee on 28 March only five days after the medical reports were sent to Hinks. It seems inconceivable that Farrar who was a strong supporter of Finch did not communicate this information to the other members of the Everest Committee as soon as possible. Yet Mallory stated in a letter to Winthrop Young that 'Wollaston told me that there could be no question of taking Finch after the doctor's report.' This statement by Wollaston suggests that he was biased against Finch. He was apparently willing to ignore Dreyer's report.

How is it possible then to explain Finch's rejection? As has been discussed extensively elsewhere, Finch had strong supporters like Farrar, but powerful enemies including Hinks, Secretary of the Everest Committee. There had been several instances in the past where Hinks's animosity towards Finch had been clearly demonstrated and it may be that he and perhaps others were looking for an excuse to reject Finch. The most likely scenario, unpleasant as it is, is that the wishes of the Everest Committee to rescind Finch's invitation were made known to the two examining physicians,

and further that the evidence from Dreyer's low-pressure chamber experiments was deliberately suppressed.

There is another possible sequence of events that might be considered. Suppose that Farrar had learned from meetings of the Everest Committee, or private conversations with some of the members, that Hinks and perhaps others were determined to reject Finch, and planned to use the medical reports as the excuse. Farrar then tells Dreyer who carries out the high-altitude test a week after the medical tests. Dreyer then writes his letter specifically to counter Hinks's plans. However, the Everest Committee recognizes that this is why Dreyer did the test, and Dreyer's letter is therefore suppressed. According to Scott Russell it did not surface until 1986 when Mrs Christine Kelly, the RGS Archivist, unearthed it for Scott Russell in a file connected with Primus stoves. Perhaps this explanation is a little gothic but it is interesting.

1922 Expedition

Eight months later, in November 1921, Finch was re-examined by Dr Larkins and declared fit. He reported 'I have also re-examined G I Finch today. He is now absolutely fit and has lost his glucosuria [sugar in the urine]. In my first report on him I stated that I thought all he needed was to get into training.' Finch was accordingly selected for the 1922 expedition and in January 1922 was tested again by Dreyer in the low-pressure chamber. This time the chamber altitude was set at 7010m and Finch performed the stepping test with a 14kg load. We have to marvel first at Finch's outstanding performance, and secondly at Dreyer's bravado in carrying out such a dangerous test. Incidentally, T H Somervell was also tested using the same protocol but was stopped after the fifth step and oxygen was forcibly administered to prevent him from fainting.

Because of the obvious value of oxygen as shown in the low-pressure chamber studies, the Everest Committee agreed that equipment should be prepared for the 1922 expedition and Finch took a leading role in developing this. Dreyer contributed much expertise because he had very successfully designed oxygen for use at high altitude by aviators during and after the First World War. It is interesting that the equipment that was developed had many similarities with that used to such great effect in 1953.

The story of the 1922 expedition is well known and will not be repeated here. The use of oxygen was controversial and some of the climbers tended to ridicule the equipment. Mallory went so far as to refer to its use as a 'damnable heresy' which mystified Finch who pointed out that mountaineers used many other technical advances to improve their performance at high altitude. Finch had a rigorous professional attitude derived from his scientific training and this was evident in other logistical aspects of the expedition as well.

Finch and Geoffrey Bruce carried out the first trials of the oxygen equipment at high altitude towards the end of May 1922 and immediately



FINCH WEARING HIS OXYGEN EQUIPMENT ON THE 1922 EXPEDITION

obtained convincing results. It was clear that climbers who used oxygen could outpace those who were breathing air. Estimates of the extent to which oxygen increased the climbing rate varied from 50 per cent to 300 per cent. Eventually Finch and Bruce reached an altitude of 8320m using oxygen, higher than any human had been before. However they had been considerably weakened by a fierce storm that kept them tent-bound for two nights and a day, and they had to retreat although they were only a little over 500m from the summit.

1924 and after

The final chapter in the Finch controversy was in many ways as mysterious as the first. In 1922 Finch had clearly demonstrated the value of oxygen for climbing at extreme altitude and indeed had, with Bruce, attained the altitude record. Furthermore, Finch was a professional scientist with strong engineering skills, and he had been intimately involved with the design of the equipment for the 1922 expedition. There is no doubt that Finch knew more about the technical aspects of high-altitude oxygen than any other mountaineer of his day. It was not surprising therefore that when the plans for the 1924 expedition were discussed in June 1923, Finch was invited to advise the Everest Committee on the use of oxygen. It would be natural to conclude that in the light of all these qualifications, Finch would be an obvious choice for the 1924 expedition. However he was not selected by the Everest Committee and indeed never again had an opportunity to test the value of oxygen at extreme altitude.

The reasons why Finch was not invited to join the 1924 expedition have been discussed in detail by Scott Russell and others and will only be briefly referred to here. First there was a bitter dispute with Hinks about lectures that Finch was invited to give in Switzerland about the 1922 expedition. Stringent limitations were laid down and Finch argued that they were unreasonable. But there were other tensions as well which have been described elsewhere. Finch had a reputation for being an outspoken, unconventional Australian in a setting where these characteristics created controversy. His schooling and university training on the Continent contrasted with the public school and Oxbridge or military background of most members of the first three Everest expeditions. He was very much a square peg in a round hole in the setting of the Alpine Club in the early 1920s.

Finch went on to become an eminent physical chemist at Imperial College and was elected a Fellow of the Royal Society in 1938. His research was particularly directed to the surface chemistry of metals but included the properties of lubricants and electron diffraction in small crystals. Happily, in spite of his early differences with the Alpine Club, he was eventually elected as its President and served in that position from 1959 to 1961 immediately following the term of John Hunt.

Finally it could be argued that the pioneering work which Finch carried out on high-altitude oxygen equipment in 1922 played a role in the first ascent of Everest in 1953. Several features of the 1924 equipment, such as the economiser to reduce wastage of oxygen, were used in the 1953 sets. John Hunt was under no illusions about the value of oxygen in the first ascent. He wrote after the expedition: 'Among the numerous items in our inventory, I would single out oxygen for special mention. Many of our material aids were of great importance; only this, in my opinion, was vital to success. But for oxygen, without the much-improved equipment which we were given, we should certainly not have got to the top.'

Hunt also alluded tangentially – and in the nicest possible way – to the Finch controversy when he wrote a foreword to the 1988 reprint of *The Making of a Mountaineer*, which was edited by Scott Russell. He referred to Finch's exclusion from the 1921 expedition on 'dubious medical grounds' and added: 'The chapter on the Everest expedition in 1922 added a dimension of realism to the heroic and romantic character of the attempt on the summit which followed two years later. I felt that George Finch, who had done so much to show how the physiological problems might be solved, might well have played an important – perhaps a decisive – part in the ill-fated 1924 expedition.'

History is replete with 'what ifs.' But the temptation to ask the question here is overwhelming. What if Finch had been allowed to take part in the 1921 expedition and had worked on the development of climbing oxygen? Would this have improved the equipment that was used in 1922, allowed him to reach an even higher altitude, and defused some of the antagonism towards oxygen? Finally, with Finch's input in 1924, would oxygen finally have come into its own enabling Finch to go much higher, perhaps to the summit, and Mallory and Irvine to do the same?

This article is based on a more technical and extensive analysis of the physiological and medical aspects of the Finch controversy which was published in the Journal of Applied Physiology 94, 1710-1713, 2003. That article also includes detailed references to the sources of the information.