

picture is a good innovation. But the deep blue tint of the print cannot do the negative justice, and it seems a pity when an effect of sunlight has been so admirably secured to adopt a tone suggestive of moonlight. On the other hand, Mr. Spencer's 'Avalanche near Zermatt,' an impressive and novel view, is well suited by the paler blue tone of the print. The broken lights of the fallen mass of snow are excellently rendered. Indeed, Mr. Spencer in all his pictures shows true and keen sense of values, and, while avoiding conventionality of composition, secures pictorial qualities. As an instance, his 'View near Saas Fée' may be noted, and the fine landscape from the Aiguille Verte. It would be well for the Club to institute 'si parva licet componere magnis,' a kind of Chantrey collection, and to secure two or three of the best photographs of the year for permanent display in the rooms. Had such a selection been made by ballot this year, Mr. Spencer would probably have been at the top of the poll.

Good work was also sent in by Messrs. Scriven, Goodenough, Calvert, Bullock, Compton, Brushfield, Withers, and Thompson.

Last, but certainly as one of the very finest pictures in the room, we have to mention Mr. Garwood's magnificent 'Kings Bay Glacier, Spitzbergen.'

A melancholy interest was added to the exhibition by the photographs of some of the relics of the Arkwright catastrophe (Mont Blanc, 1866), which came to light this year near the summit of the Glacier des Bossons. We believe that the negatives, taken by a Chamonix photographer, showing the remains of the unfortunate victim, were happily bought up by his relatives. This horrible misuse of a useful science cannot be too strongly condemned. We have been informed, to our great regret, that in the case of the bringing down of the bodies of the unfortunate Dr. Schnurdreher and the Courmayeur guides killed with him, the disgusting photographs, taken also by a Chamonix photographer, found the largest sale amongst our own country people. We can only hope that this is not true, and that the public generally, in whose hands it rests mainly, will prevent a recurrence of similar scandals by refusing to buy such gruesome mementoes.

THE HIGHEST CLIMBS ON RECORD.

A NOTE BY DOUGLAS W. FRESHFIELD.

In an Article on Mountaineering in Part XI. of the 'Encyclopædia of Sport,' now in course of publication, Sir Martin Conway calls in question the claim of the party consisting of Mr. W. W. Graham and the late Emil Boss and Ulrich Kaufmann to have reached a point within 50 ft. of the summit of Kabru (24,015 ft.) in Sikkim in the autumn of 1883.

Sir Martin Conway gives the two following reasons for not accepting Mr. Graham's statement :—

1. That 'it is the matured conviction of English officials who were in the country'—he writes elsewhere 'on the spot' (p. 47)—'at the time, and who discussed the matter with Mr. Graham when his memory was fresh, that he was mistaken, and that he reached no such great altitude.'

2. That 'at the height he did attain neither he nor his companions experienced any of the effects of diminished atmospheric pressure, such as have invariably been observed by all who have reached 20,000 ft. and upwards.'

As to the first point, before I wrote the article contained in vol. xii. of this Journal, to which I must refer those interested, I had myself fully discussed the subject with many of the officials who were in the country (there were, I believe, no officials 'on the spot,' unless this phrase is to be taken to include a radius of about forty miles), and I had read with care the statements of their reasons for disbelief as recorded in writing. The result of this inquiry—independently of my further examination of the travellers—was to convince me that the opinion of officials, none of whom had any knowledge of mountain-craft, was worth no more in the Himalayas than it was in the Caucasus or elsewhere. The point of view of the average official mind is the same all the world over. It has been tersely summarised in these doggerel lines :—

I am *the* old inhabitant,
And what I cannot do you can't.

Before considering the second and more serious objection urged by Sir Martin Conway, it seems proper to take into account all that he says of mountain sickness in a subsequent part of his Article.

On page 47 he refers to the very high ascents made beyond Kashmir in 1865 by a surveyor of the name of Johnson, who received an Honorary Award (as did Emil Boss) from the Royal Geographical Society. After most careful references to Mr. Johnson's superiors, and to his friend and colleague in Kashmir, the late Mr. Drew, of Eton College, I made public all that is known about his travels in vol. xii. pp. 58-60 of this Journal. His highest reported ascent, 23,870 ft., is extremely doubtful, but there are two of over 21,000 ft. which cannot be safely set aside, while it seems certain that a good deal of planetable and trigonometrical work was done by the Surveyor and his assistants at heights of over 20,000 ft. Sir M. Conway however (p. 47) declines to consider these ascents, which were accepted by the Council of the Royal Geographical Society under the Presidency of Sir Henry Rawlinson, and by Colonel Montgomerie, one of the chiefs of the Survey of India—Nor does he refer to the statement of Colonel Tanner, of the Indian Survey (Survey Reports, 1884-5) quoted in this Journal, vol. xiii. p. 27, that in mid-November a party of native surveyors, carrying a sick comrade in a litter all the way, crossed a pass of 'about 20,000 ft.' N. of Kinchinjanga.

Sir Martin Conway goes on to assert that every climber, 'with the sole exceptions of Messrs. Graham and Johnson, whose altitudes are disputed, has experienced, at heights of over 18,000 ft., exactly the same discomforts and impediments owing to the rarity of the air and the consequent imperfect oxidisation of the blood.' 'The level,' he writes, 'where they are not to be overcome, but must be endured, seems to be about 18,000 ft. On the same day, and at the same point, all the members of a party generally begin to feel inconvenience together.' I fully admit that Sir M. Conway's personal experience, extending as it does 4,000 ft. beyond my own, gives him an initial advantage in this discussion. But it cannot, I think, be held to justify the general assertions made above, in so far as they are not in accordance either with my own experience or with that of others. I, it is true, have only been 450 ft. above Sir M. Conway's starting-point; but Dr. Collie's evidence cannot be dismissed on any such ground, and he tells me that Mr. Mummery climbed, and climbed hard, without serious discomfort, between 18,000 and 21,000 ft. in the Nanga Parbat group. Further, the statement as to the simultaneousness of the symptoms in the members of a party might be contradicted by a hundred examples. I will note two only, the party on Nanga Parbat and that on Mount St. Elias, where Signor Sella tells me neither he nor the Duke of the Abruzzi suffered, while some of their companions felt more or less uncomfortable. I am quite unable, therefore, to accept general deductions as to the effect of high climbs on the human frame which appear to be based on the rejection of any experiences that do not support them, if not on an imperfect appreciation of the facts. Moreover, I am led on to inquire how far Sir M. Conway has succeeded both in correctly diagnosing his symptoms and in interpreting their efficient causes. Throughout his argument Sir Martin Conway seems to assume as proved that the symptoms of his party were caused by altitude. In his 'Travels' (vol. ii., p. 524) he tells us: 'I took tracings with a sphygmograph of Zurbriggen's pulse and mine; and here the damaging effect of altitude made itself apparent. Our breathing apparatus was working well enough, but our hearts were being sorely tried, and mine was in a parlous state. We had all practically reached the limit of our powers. We might all have climbed 1,000 ft. higher, or even more, had the climbing been easy, but Zurbriggen said that not another step would he cut. . . . *We were all weakened, not so much by the work of the previous hours, as by the continued strain of the last three weeks.*' The last sentence I have italicised, because it struck me on first reading as significant. But it becomes much more so when we turn to the paper by the late Professor Roy on the climbers' symptoms recorded by Sir Martin Conway, which was subsequently published in the Scientific Appendix to his 'Travels.' Professor Roy writes, 'I conclude that fatigue or excitement (probably the former), rather than the rarefaction of the atmosphere, is the cause of the quick pulse rate which is associated with mountain sickness. Figures 4-12 show that at heights of 17,000-23,000 ft. the heart-

beat need not be greatly quickened. Acceleration of the heart in mountain climbing is a measure of fatigue or nervous excitement rather than of asphyxia from rarefaction of the air, which is a matter of considerable interest, since it shows that when the "nervi accelerantes cordis" are called into play it is not the want of oxygen, but of something else, that brings their reflex mechanism into activity.'

Professor Roy concludes his examination of Sir M. Conway's physiological observations and records as follows :

'There is only one other point: how far, judging from the observations and tracings reproduced above, Conway had reached the highest climbable altitude. . . . There is no obvious reason why Conway and his party should not have gone higher, if they could do it quickly enough, and if they could choose their own times for going on, and campings, &c., which, of course, is the real difficulty. The curves show that they were in a condition to go on, and they agree with Conway's own feeling that they had not come to the end of their tether.' *

Before leaving this branch of the subject I must fortify my argument with the testimony of a witness, probably the best qualified in this country as both a climber and a physiologist to give expert evidence. As recently as 1895 Mr. Clinton Dent laid his opinion before a scientific audience in the following terms:—'There is no doubt about the height of the mountain (Kabru), which has been triangulated, but the question is whether the travellers did not mistake the peak they actually ascended. Whether the party did so or not, seeing that there is conflict of opinion, must remain uncertain. But the Karakoram experience (Sir M. Conway's), the latest, tends to show that it was certainly not physically impossible.' † A writer of authority—it might be rash to say another writer—has, in the 'Edinburgh Review' for July 1897, stated more precisely his reasons for rejecting the conclusions drawn by Sir M. Conway from his own symptoms. For fear of being charged with unfairness, I prefer to give the passage as a whole. 'Sir Martin Conway notes, incidentally, the interesting fact that he was attacked at a height of only 7,000 ft. with the symptoms in a mild form of mountain sickness. Experience in the Karakorams led him at once to recognise the "peculiar fatigue and the discomfort if the regularity of breathing were interfered with." He asserts roundly that the cause of mountain sickness is diminution of the supply of oxygen, adopting the view that Mr. Paul Bert insisted on so strongly. Modern researches seem to indicate that this is only part of the truth. The question is too complex to be fully discussed here, but we may note that the author adopts unreservedly the logical conclusion of his opinions, and he believes that "the vigour of

* *Climbing in the Himalayas*—Scientific Reports, p. 60.

† 'The Influence of Science on Mountaineering,' by Clinton Dent, F.R.C.S., *Proceedings of the Royal Institution*, vol. xiv. See also Mr. Dent's papers 'Can Mount Everest be Climbed?' *Nineteenth Century*, October 1892, and 'The Physiological Effects of High Altitudes,' *Geographical Journal*, January 1893.

every man begins to be diminished at a very moderate height [amount not stated] above sea level, and diminishes further with every increment of height till a level is reached at which even the dullest observer perceives that something is wrong." The explanation is summary, if not hasty, while it takes no account of physiological disturbances of the circulatory and nervous systems, of the altered tension of the gases of the body, or of the conditions that combine to conduce fatigue.'

It appears, therefore, that two of Sir Martin Conway's premises are unproven. Discomforts, if commonly felt in high ascents, cannot be shown to be universally or equally felt, while scientific authorities are not prepared to admit that the diminished atmospheric pressure is the sole or chief cause of the discomforts in question. We do know that such discomforts were associated with all the early ascents of Mont Blanc, and are still felt from time to time by climbers on that mountain, and that they may be experienced in a modified form even as low as 7,000 ft. by so old a climber as Sir M. Conway himself.* Looking to the experience of the past 100 years, it is at least open to argument that in the next century persons of good digestions and stolid temperaments, starting in fine training from tolerably comfortable huts or bivouacs, may hope to disregard the 'rarity of the air' on any mountain on the face of the globe.

Those who think otherwise may make the most of the inconveniences generally endured at the greatest altitudes hitherto reached. They may reinforce their argument by the record of the various feelings of Mr. FitzGerald and his friends on Aconcagua, about to be published. But the fact will remain that most of the arguments which can be adduced now for asserting that the limit of human powers is met with at about 23,000 ft. might have been equally well adduced 100 years ago to prove that that limit lies at about 16,000 ft. I believe that the Alpine Club will in the next century carry that limit 6,000 ft. higher still.

I will now proceed to consider in some detail Mr. Graham's account of his ascent of Kabru. I believe we shall find reason to believe that, though not incapacitated, his party were very sensibly affected by the ascent. Mr. Graham himself describes † certain symptoms. It must be remembered that Boss and Mr. Graham were in the Alps among our fastest climbers. The ordinary pace up Mont Blanc, above the Grand Mulets, is 1,000 ft. an hour. In the first ascent of Elbruz, including a long level traverse, we made 800 ft. an hour, the last 2,500 ft. being done under three hours. From 18,500 to 22,500 ft. the Himalayan climbers made less than 900 ft. an hour. From that point to 23,950 ft., with a good deal of step-cutting, 600 ft. an hour. Sir Martin Conway himself accomplished his last 1,250 ft. in 2½ hrs., though before starting from his 20,000 ft. bivouac he was so exhausted by previous hardship and exposure that 'after lacing a boot one had

* See *The Alps from End to End*, p. 13.

† *Alpine Journal*, vol. xi. p. 40.

to lie down and take breath.' Zurbriggen was able to smoke a cigar on the top, and, according to Dr. Mosso ('Fisiologia dell' Uomo sulle Alpi') he is a man of normal frame. Zurbriggen further told the doctor that, though he had to rest after cutting every half dozen steps, he believed he could have gone much higher! After making all needful allowances, the discrepancy between the experiences of Graham's and Conway's parties seems little, if at all, greater than that between those of the first two parties on Elbruz. It is true our ascent in 1868 has been disputed by Russians!

Even if it be proved—as I claim it to be—that Mr. Graham's story is not *a priori* incredible, it of course by no means follows that it is true. It remains perfectly open to serious argument that he was mistaken in his identification of the peak attained, or that Emil Boss and he deliberately conspired to deceive the public in claiming to have reached a point within 50 ft. of the top of Kabru (24,015 ft.) Let it be remembered that here there is no other question than that of identification. The height is trigonometrically fixed, and not dependent on any traveller's measurements.

The former hypothesis, that of a mistaken identification, adopted by Sir Martin Conway, may at first sight seem plausible and even highly probable. Climbers have frequently made such mistakes in cloudy weather. But it becomes, I think, less probable on examination of books, maps, and photographs, and of the circumstances.

The day was cloudless. Mr. Graham made the ascent on his second visit to Sikkim, when he was already familiar with the country. Kabru, we have Sir J. Hooker's word for it, is very conspicuous, and only 8 miles off from Jongri, and is also seen from the neighbourhood of the Kangla Pass as 'a white screen.' Its position with regard to Kinchinjanga should render it easy of recognition.

The second hypothesis, that of deliberate deceit, has not, I believe, been suggested, at any rate in print. Emil Boss was not himself before his death, and at times told incredible stories. But he was capable of very clear and precise statements when I saw him first, and they were in close agreement with Mr. Graham's. No one, I think, can read Mr. Graham's account without seeing that it is that of a young and casual climber, who wrote quickly and carelessly; of one liable to fall into inaccuracies or hasty assumptions in matters of detail; of one who made the least of his own symptoms, cared more for adventure than for science, and was very apt to record with undue respect uncorrected aneroid readings. For this last failing, perhaps, I am partly responsible, for I begged him to give in his paper any 'observations' he had.

But, as I have said before, the most careful separate examination of Boss and Mr. Graham, immediately on their return, failed to produce in my mind any ground for doubting the substantial accuracy of their story, and I think very few mountaineers who read carefully not only Mr. Graham's paper in vol. xii., but also his private letters printed in vol. xi. of this Journal, will come to

any other conclusion than I did: that to treat his story as unworthy of credence is a most hazardous course.

One word more only. With regard to the sufficiency of the evidence to establish the identification of the point reached, Sir M. Conway is, of course, competent and fully entitled to form and express an independent opinion. The matter is one fairly open to argument. But assertions made in a work of reference, which may naturally be regarded as a work of authority, seem to me to stand on a somewhat different footing from arguments introduced in a personal narrative. I think it is desirable, therefore, that the Club and the public should be reminded of a fact, which I am sure my friend Sir Martin Conway will be the first to admit, that the opinions expressed in the 'Encyclopædia of Sport' are not the summing-up or even the *obiter dicta* of a judge, but the plea of an advocate who is personally interested in the matter, and has moreover omitted to notice the statements of the case for the other side to be found in past numbers of this Journal and elsewhere.

The discussion can only be finally set at rest when climbers such as Mr. Graham's party were attack in earnest the great Sikkim peaks, explore the slopes of Kabru from the direction in which Mr. Graham approached them, and test, as far as they can be tested, the possibilities of mountain-climbing in that region. Until this has been done I shall prefer to run the risk of being proved too credulous to that of having been needlessly sceptical.

P.S.—Sir M. Conway tells me that he has a note from an Indian official, enclosing a photograph which shows that from the crest of the Kangla Pass the summit only of Kabru is visible over a nearer spur or summit. It is inferred that Mr. Graham's description of Kabru, seen from a point near the Kangla Pass, as rising due E., 'its western face almost like a wall,'* must be taken as a proof of his erroneous identification of that mountain. On referring to Sir J. Hooker's 'Travels,' I find the following description of the view from the Yalloong Valley in the immediate neighbourhood of the Kangla Pass: 'Looking E., I had a splendid view of the broad snowy mass of Kubra' (Sir J. Hooker always uses this form of the name) 'blocking up, as it were, the head of the valley with a white screen.' On the copy in the R.G.S. Library an anonymous commentator has erased 'Kubra,' and written Kangla, while a second traveller has written 'Kabru seen over Kangla.' Only the top of Mont Blanc is seen from Sallanches, yet many travellers have described 'the view of Mont Blanc' from that place without injury to their reputation. Mr. Graham may not be always accurate; here, however, he seems to be unconsciously at one with Sir Joseph Hooker.

* *Alpine Journal*, vol. xii. p. 38.