

or two strong sensations. To those intending to try it I can only suggest one piece of advice: insure your lives before starting, or, what is the same thing, take Almer and Melchior as your guides.

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NARRATIVE OF THE FATAL ACCIDENT ON THE HAUT-DE-CRY, CANTON VALAIS. By PHILIP C. GOSSET.

IT has often occurred to me, when walking on hard snow in winter, that a mountain ascent at that period of the year might be made with much less difficulty and trouble than in summer. With this view I made several excursions in winter, and came to the conclusion that the mean temperature at a certain elevation, up to 8,000 feet, is not so low as might be expected. In some cases I believe it to be higher than in the plain of Switzerland. The plain is covered with fog for weeks in winter. In the morning the fog lies close to the earth, at noon it rises to the height of a few hundred feet, and in the evening it comes down again. During three weeks running, often longer, you cannot see the sun, and the ground is frozen hard. Above the fog the sun is shining brightly on the mountain peaks. It is therefore easy to understand that unless the fog is kept off by a strong NE. wind (which is generally not the case in winter at least), the temperature of the upper regions is higher than that of the plain. As an example tending to prove this assertion, I may mention that I have found flowers blooming on arêtes on the Rothhorn and Niesen at the height of 7,000 feet, when there was not a flower in the plain of the Canton of Berne (on December 31, 1861, and on February 4, 1860). Amongst these flowers were the *Gentiana verna* and *Viola calcarata*.

My friend B. was familiar with mountains in winter; he had been up the *Æggischhorn* and *Riederhorn* in December, 1863: easy as these points may be to reach in summer, in winter, if the snow is not hard, the question is very different. On February 28, 1864, we left Sion with Bennen to mount the Haut-de-Cry. We started at 2.15 A.M. in a light carriage that brought us to the village of Ardon, distant six miles. We there met three men that were to accompany us as local guides or porters, Jean Joseph Nance, Frederic Rebot, who acted as my personal guide, and Auguste Bevard. We at once began to ascend on the right bank of the Lyzerne. The night was splendid, the sky cloudless, and the moon shining so as to make walking easy without the use of a lantern. For about half-an hour we went up through the vineyards by a rather steep

path, and then entered the valley of the Lyzerne, about 700 feet above the torrent. We here found a remarkably good path, gradually rising and leading towards the Col de Chéville. Having followed this path for about three hours we struck off to the left, and began zigzagging up the mountain side through a pine forest. We had passed what may be called the snow-line in winter a little above 2,000 feet. We had not ascended for more than a quarter of an hour in this pine forest before the snow got very deep and very soft. We had to change leader every five or six minutes, and even thus our progress was remarkably slow. We saw clearly that, should the snow be as soft above the fir region we should have to give up the ascent. At 7 A.M. we reached a *châlet*, and stopped for about twenty minutes to rest and look at the sunrise on the Diablerets. On observing an aneroid, which we had brought with us, we found that we were at the height of about 7,000 feet: the temperature was  $-1^{\circ}$  C.

The Haut-de-Cry has four *arêtes*: the first running towards the W., the second SE., the third E., and the fourth NE. We were between the two last-named *arêtes*. Our plan was to go up between them to the foot of the peak, and mount it by the *arête* running NE. As we had expected, the snow was in much better state when once we were above the woods. For some time we advanced pretty rapidly. The peak was glistening before us, and the idea of success put us in high spirits. Our good fortune did not last long; we soon came to snow frozen on the surface, and capable of bearing for a few steps and then giving way. But this was nothing compared to the trouble of pulling up through the pine wood, so instead of making us grumble it only excited our hilarity. Bennen was in a particularly good humour, and laughed loud at our combined efforts to get out of the holes we every now and then made in the snow. Judging from appearances, the snow-field over which we were walking covered a gradually-rising Alp. We made a second observation with our aneroid, and found, rather to our astonishment and dismay, that we had only risen 1,000 feet in the last three hours. It was 10 o'clock: we were at the height of about 8,000 feet; temperature =  $-1.5$  C. During the last half-hour, we had found a little hard snow, so we had all hope of success. Thinking we might advance better on the *arête*, we took to it, and rose along it for some time. It soon became cut up by rocks, so we took to the snow again. It turned out to be here hard frozen, so that we reached the real foot of the peak without the slightest difficulty. It was decidedly steeper than I had expected it would be, judging

from the valley of the Rhone. Bennen looked at it with decided pleasure; having completed his survey, he proposed to take the eastern arête, as in doing so we should gain at least two hours. Rebot had been over this last-named arête in summer, and was of Bennen's opinion. Two or three of the party did not like the idea much, so there was a discussion on the probable advantages and disadvantages of the NE. and E. arêtes. We were losing time; so Bennen cut matters short by saying: 'Ich will der Erste über die arête!' Thus saying, he made for the E. arête; it looked very narrow, and, what was worse, it was considerably cut up by high rocks, the intervals between the teeth of the arête being filled up with snow. To gain this arête, we had to go up a steep snow-field, about 800 feet high, as well as I remember. It was about 150 feet broad at the top, and 400 or 500 at the bottom. It was a sort of couloir on a large scale. During the ascent we sank about one foot deep at every step. Bennen did not seem to like the look of the snow very much. He asked the local guides whether avalanches ever came down this couloir, to which they answered that our position was perfectly safe. We had mounted on the northern side of the couloir, and having arrived at 150 feet from the top, we began crossing it on a horizontal curve, so as to gain the E. arête. The inflexion or dip of the couloir was slight, not above 25 feet, the inclination near 35°. We were walking in the following order: Bevard, Nance, Bennen, myself, B., and Rebot. Having crossed over about three-quarters of the breadth of the couloir, the two leading men suddenly sank considerably above their waists. Bennen tightened the rope. The snow was too deep to think of getting out of the hole they had made, so they advanced one or two steps, dividing the snow with their bodies. Bennen turned round and told us he was afraid of starting an avalanche; we asked whether it would not be better to return and cross the couloir higher up. To this the three Ardon men opposed themselves; they mistook the proposed precaution for fear, and the two leading men continued their work. After three or four steps gained in the aforesaid manner, the snow became hard again. Bennen had not moved—he was evidently undecided what he should do; as soon, however, as he saw hard snow again, he advanced and crossed parallel to, but above, the furrow the Ardon men had made. Strange to say the snow supported him. While he was passing I observed that the leader, Bevard, had ten or twelve feet of rope coiled round his shoulder. I of course at once told him to uncoil it and get on the arête, from which he was not more than fifteen feet distant. Bennen then

told me to follow. I tried his steps, but sank up to my waist in the very first. So I went through the furrows, holding my elbows close to my body, so as not to touch the sides. This furrow was about twelve feet long, and as the snow was good on the other side, we had all come to the false conclusion that the snow was accidentally softer there than elsewhere. Bennen advanced; he had made but a few steps when we heard a deep, cutting sound. The snow-field split in two about fourteen or fifteen feet above us. The cleft was at first quite narrow, not more than an inch broad. An awful silence ensued; it lasted but a few seconds, and then it was broken by Bennen's voice, 'Wir sind alle verloren.' His words were slow and solemn, and those who knew him felt what they really meant when spoken by such a man as Bennen. They were his last words. I drove my alpenstock into the snow, and brought the weight of my body to bear on it. I then waited. It was an awful moment of suspense. I turned my head towards Bennen to see whether he had done the same thing. To my astonishment I saw him turn round, face the valley, and stretch out both arms. The ground on which we stood began to move slowly, and I felt the utter uselessness of any alpenstock. I soon sank up to my shoulders and began descending backwards. From this moment I saw nothing of what had happened to the rest of the party. With a good deal of trouble I succeeded in turning round. The speed of the avalanche increased rapidly, and before long I was covered up with snow. I was suffocating when I suddenly came to the surface again. I was on a wave of the avalanche, and saw it before me as I was carried down. It was the most awful sight I ever saw. The head of the avalanche was already at the spot where we had made our last halt. The head alone was preceded by a thick cloud of snow-dust; the rest of the avalanche was clear. Around me I heard the horrid hissing of the snow, and far before me the thundering of the foremost part of the avalanche. To prevent myself sinking again, I made use of my arms much in the same way as when swimming in a standing position. At last I noticed that I was moving slower; then I saw the pieces of snow in front of me stop at some yards' distance; then the snow straight before me stopped, and I heard on a large scale the same creaking sound that is produced when a heavy cart passes over frozen snow in winter. I felt that I also had stopped, and instantly threw up both arms to protect my head in case I should again be covered up. I had stopped, but the snow behind me was still in motion; its pressure on my body was so strong, that I thought I should be crushed to death. This

tremendous pressure lasted but a short time; I was covered up by snow coming from behind me. My first impulse was to try and uncover my head—but this I could not do, the avalanche had frozen by pressure the moment it stopped, and I was frozen in. Whilst trying vainly to move my arms, I suddenly became aware that the hands as far as the wrist had the faculty of motion. The conclusion was easy, they must be above the snow. I set to work as well as I could; it was time, for I could not have held out much longer. At last I saw a faint glimmer of light. The crust above my head was getting thinner, but I could not reach it any more with my hands; the idea struck me that I might pierce it with my breath. After several efforts I succeeded in doing so, and felt suddenly a rush of air towards my mouth, I saw the sky again through a little round hole. A dead silence reigned around me; I was so surprised to be still alive, and so persuaded at the first moment that none of my fellow-sufferers had survived, that I did not even think of shouting for them. I then made vain efforts to extricate my arms, but found it impossible; the most I could do was to join the ends of my fingers, but they could not reach the snow any longer. After a few minutes I heard a man shouting; what a relief it was to know that I was not the sole survivor! to know that perhaps he was not frozen in and could come to my assistance! I answered; the voice approached, but seemed uncertain where to go, and yet it was now quite near. A sudden exclamation of surprise! Rebot had seen my hands. He cleared my head in an instant, and was about to try and cut me out completely, when I saw a foot above the snow, and so near to me that I could touch it with my arms, although they were not quite free yet. I at once tried to move the foot; it was my poor friend's. A pang of agony shot through me as I saw that the foot did not move. Poor B. had lost sensation, and was perhaps already dead. Rebot did his best: after some time he wished me to help him, so he freed my arms a little more so that I could make use of them. I could do but little, for Rebot had torn the axe from my shoulder as soon as he had cleared my head (I generally carry an axe separate from my alpenstock—the blade tied to the belt, and the handle attached to the left shoulder). Before coming to me Rebot had helped Nance out of the snow; he was lying nearly horizontally, and was not much covered over. Nance found Bevard, who was upright in the snow, but covered up to the head. After about twenty minutes the two last-named guides came up. I was at length taken out; the snow had to be cut with the axe down to my feet before I could be pulled out. A few minutes after

1 o'clock P.M. we came to my poor friend's face. . . . I wished the body to be taken out completely, but nothing could induce the three guides to work any longer, from the moment they saw that it was too late to save him. I acknowledge that they were nearly as incapable of doing anything as I was. When I was taken out of the snow the cord had to be cut. We tried the end going towards Bennen, but could not move it; it went nearly straight down, and showed us that there was the grave of the bravest guide the Valais ever had, and ever will have. The cold had done its work on us; we could stand it no longer, and began the descent. We followed the frozen avalanche for about twenty-five minutes, that being the easiest way of progressing, and then took the track we had made in the morning; in five hours we reached Ardon.

I have purposely put apart the details I have been asked to give on certain points.

1. The avalanche consisted only of snow; the upper stratum was eleven days old. At the moment the avalanche started it was about twelve o'clock, probably a few minutes before. The temperature was then above freezing point, and we were within 300 or 350 feet from the summit. The snow was thawing, and the whole snowfield in a state of uncertain equilibrium. By cutting through the snow at the top of the couloir we cut one of the main points by which the snow of the two different layers held together; what led us into the error was, as I have before said, the fact that the snow was quite hard in some places, and quite soft in others. The avalanche may have taken a minute to descend; I can give no correct estimation on this point.

2. The rope was in my opinion the cause of my poor friend's as well as of Bennen's death. The following facts may prove it:—At the moment the avalanche started the first and last guides merely held the rope; Bennen had not seen the use of a rope at all, so we had been less strict than we should otherwise have been in its use. During the descent the rope caught, probably on a rock below the surface. This happened between Bennen and Nance, that is to say between the second and third man in the marching line. Nance told me afterwards that this was the worst part of the descent; he had the pressure of the snow on his body, whilst the rope nearly cut him in two. I believe it was at this moment that Bennen and B. lost their upright position, owing to the pressure of the snow on their backs. Nance also lost his position, but was fortunate in being thrown out horizontally, and that almost on the surface of the avalanche. I was between Bennen and B., but not tied to the rope, as I

had iron rings to my belt through which the cord ran. Rebot, who was last in the line, was thrown clean out of the avalanche; he was carried during the descent towards one of the sides of the stream. He was the only one of us who escaped unhurt. Thus, when we stopped in our descent, two only were tied to the rope, B. and Bennen—the very two who perished.

3. The congealing of the snow happened by pressure. The fore part of the avalanche stopped first, and the rest was forced against it. The circumstance I can least understand is the sudden fall in the temperature of the air after the accident. I can give no estimate of it, but it was intense.

4. The bruises Bevard, Nance, and I sustained were slight, but our feet were severely frost-bitten. Bennen has been accused of rashness in this unfortunate accident. It is not the case. He was misled by the total difference of the state of snow in a winter ascent from what is to be met with in summer.

THE GRANDES ROUSSES OF DAUPHINE. By WM.  
MATHEWS, JUN., M.A.

WHEN I had the happiness of standing on the summit of the Mont Pourri with my friend the Rev. T. G. Bonney, in August 1862, and of gazing upon the noble panorama of the Dauphiné Alps from that admirable point of view, our attention was attracted by a vast mass of glacier-clad mountain standing out by itself to the west of the main chain. We subsequently identified it as the Grandes Rousses, and when we drew up our programme for the campaign of 1863, we resolved that the ascent of its highest peak should be one of our first expeditions.

The district is so imperfectly represented upon all the maps hitherto published, that it was important to us to obtain some more trustworthy information, and I spent a day in Paris at the end of last July for the purpose of consulting the manuscript map of the French Government at the *Dépôt de la Guerre*. By the courtesy of the authorities I was permitted to inspect not only the Dauphiné sheets, but also those of the Maurienne, the survey of which had just been completed, and to make a rough tracing of them, which has formed the groundwork of the map accompanying this paper.

The Grandes Rousses is not a single peak, but a mountain range about eight miles in length, running NNE. by SSW., and steeper on the western than the eastern side. On the former it presents a lofty wall of crystalline rock, supported by projecting buttresses which rise out of a shelf of glacier rest-