the same mountain-top and own that they have neither the wish nor the inclination to go farther? Is anyone in want of occupation? Here is a riddle waiting to be solved. Here is the centre of Iceland, even in these days of discovery a land of mystery; here are huge mountain tracts containing, perhaps, unparalleled volcanic phenomena, and we know comparatively nothing about them! Upon the N. of Vatna Jökull there is a volcano of pretty frequent activity, and yet the eye of man has never rested upon it. Iceland is not more than one thousand miles from our own shores. How is it that this has not been explored long, long ago? I myself have already twice attempted to do so, and deem the task perfectly feasible, and I mean to essay it again this year; but as the expense, although not very heavy when shared by others, is almost more than I can by myself afford, I should greatly like to be accompanied by three companions—*that is if they are accustomed to hardship and mountaineering, and prepared to undergo a good deal of rough work.* I propose being absent from the end of May to the beginning of September, and I think the expenses would be from 100*l.* to 150*l.* per man. If there are any such gentlemen who would like to join me, I shall be happy if they will send in their names to the president of the 'Alpine Club.'

A Narrow Escape from Lightning on the Roche Melon. By F. F. Tuckett. Read before the Alpine Club, February 2, 1875.

Celsæ graviore casu
Decidunt turres, feriuntque summos
Fulgura montes.
Hor. *Carm.* ii. 10. 12.

My campaign was drawing to a close as, after successful assaults on the Ruitor and Pourri, I descended on July 15 from the Col de la Vanoise upon Termignon, to find the weather in the valley of the Arc in such an unpromising condition as to suggest the wisdom of abandoning the final performance in my programme—the ascent of the Roche Melon near Susa—and proceeding down the valley to Modane, *en route* for Paris, where I was due in a couple of days. A comfortable dinner, however, and the discovery of a vehicle which would take us half way to Bessans, decided me to sleep at the last-named place, so as to be ready to profit by fine weather if it should come, especially as it would still be easy to catch the

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midday express from thence by a moderately early start. So, in due course, Christian Lauener, Ferdinand Imseng, and I squeezed ourselves into one of the genuine old *char-à-bancs* which have almost totally disappeared from Switzerland, and set out for Lanslebourg and Lans le Villard.

Nothing could look much more unpromising than the weather, which, after being almost uninterruptedly fine for more than a fortnight, now seemed to show symptoms of a general break-up. Grey, sulphurous clouds were rolling steadily over the depression of the Mont Cenis; the head of the valley was almost inky in hue, and above us,

'From cape to cape, with a bridge-like shape,'

stretched a hopeless-looking canopy of dull, leaden-coloured vapour—'an under-roof of doleful grey.' Our driver, however, protested that the foe marshalling his hosts from the Italian side was only 'la Lombarde,' and that when the clouds curled over the crests in this fashion fine weather always followed soon. So, though we had our doubts, since such a state of things is elsewhere usually of the worst possible augury, we jogged on in faith. Lanslebourg was reached in about an hour, Lans le Villard in half as much more, and from thence we footed it in about two hours to Bessans, and at 8.15 entered the now fairly passable little inn of a certain M. Garinot, who had fitted up a couple of decent sleeping-rooms and a little *salle-à-manger* in a sort of *dépendance* to his own den, to which, as respects 'sweetness and light,' they offer a pleasing contrast.

Already, before we went to bed at 10, stars were peering through the mist in all directions, and when we roused at 2.15 on the morning of the 16th, a cloudless sky justified our obstinacy. Unfortunately, our wary host had locked us in, and for some time it seemed likely that we should remain prisoners until his slumbers came to a natural end, for no shouting on our parts sufficed to rouse him, until, preferring to pay for a smashed door to enduring longer incarceration, I used my axe as a knocker, and effectually 'murdered sleep.'

The great heat of the previous fortnight had gradually developed a vast amount of electric energy; every day had its thunderstorm, and each time it surged up from the Italian plains at an earlier hour, so that it was essential to attain one's summit level in each expedition as much before noon as practicable if one wished to get a view and escape a diurnal ducking. Nothing could be more lovely and promising than the look of the weather as we set forth about 3.15, and,

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traversing the fields in the valley-bottom under the guidance of our landlord, made for the narrow opening of the Val de Ribou, or Ribon, which descends in a NNW. direction from the glacier clothing the N. slopes of the Roche Melon. Arrived at the entrance of the valley, we found a good path zigzagging up the slopes on our left, and, after attaining a height of several hundred feet, carried at a tolerably uniform elevation until it reaches the grassy and absolutely treeless level of the central and upper valley. Two groups of dismal hovels—Pierregrosse and Zatté—were passed, and at 5.25 the third and highest—d'Arzellaz, or L'Arselle—were reached, and a halt called for some milk.

Again advancing at 6, with but little ascent, and with a long line of névé-crowned crags on our right, the foot of the rocky cirque which closes the head of the Val de Ribou, and seems to bar further progress, was gained in another hour, just where a curious tongue of glacier—the outfall of the extensive plateau of névé and ice lying between the summits of the Grosse Tête and Petite Tête—is protruded for a few hundred yards at a very gentle inclination, after leaping the rocky barrier in a fine and impassable icefall of something like 1,000 feet in height. We were informed at Bessans that pilgrims—women as well as men—ascend the Roche Melon from thence on the occasion of the annual fête (August 5) of the chapel on its summit; but though the difficulties on this side are not such as to prove formidable to any fair mountaineer, I confess that we all were puzzled to understand by what route the upper glacier plateau would, under such circumstances, be attained. We ourselves clambered up a steep gully or water-course near the true right bank of the icefall, choked in places by large stones and masses of debris from the cliffs above, and, further progress being at length barred by these last, we turned to the left and gained the higher level by some rather slippery rounded shelves of rock, sufficiently inclined to require care. I am disposed to think that it would be difficult for anyone unacquainted with the ground, and descending from the peak on this side, to strike the head of the gully alluded to, and that, at the expense of some loss of time, it might in such a case be a wiser course to make a very considerable detour to the E. before attempting to gain the level of the 'alp' below.

A climb of about three-quarters of an hour landed us on a little grassy plateau, affording a pleasant excuse for a second breakfast, but at 8.30 we resumed our march, and after encountering a few more easy rocks, traversing some broken ground, and following for some distance the right, or eastern,

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lateral moraine of the glacier, we finally entered on the latter about 9. It forms an undulating plateau of considerable breadth, very gently inclined in a northerly direction, and sending down tongues of ice into the Valle de Viù on the E., as well as, I imagine, in other directions besides that we had chosen. Though on a smaller scale than the Ruitor glacier, it is of the same type, and, when I add that it was covered with snow in the most treacherous condition, supporting one for a few paces and then letting one through its 'crude consistence' to flounder on, and

. . . 'swim, or sink, or wade, or creep, or fly,'

it will be understood that, as we laboriously toiled along with our goal rising abruptly in front, some impatient feelings were excited by a waste of time which threatened to rob us of the glories of the eagerly anticipated view. For, already, we could see the great rounded tops of the cumuli on the Italian side 'curling their monstrous heads' above the skyline of snow in front—an occasional skirmisher making a dash at our peak, enfolding it in its damp embrace, and then careering away, to be followed by a successor, each time after a shorter interval. The remains of the trigonometrical signal on the summit loomed out less and less distinctly, and in our impatience it seemed as though it receded as we advanced. By the time we reached the base of the final pyramid it was 10.25, and we found ourselves in that delightful state of mystification which Mr. Stephen has excellently likened to the experience of fishes in a globe of milk and water. Proceeding very cautiously through the whirling wreaths of vapour lest we should suddenly drop over upon Italy and hurt it—or ourselves—we struck up the 'final incline'—as an American companion of mine once dubbed the cone of Vesuvius as we looked down upon it from its rim—and at 11.15 stood beside the ruins of the signal and enjoyed a very magnificent view of nothing in particular. As we had plenty of time at our disposal—3½ hrs. sufficing for the descent to Susa—and the wind was keen and damp, our first proceeding was to search for the chapel, which we knew must be quite close to the summit of the peak; and, about 30 feet lower down, on the southern side, which was entirely free from snow, we came upon a tight little wooden building, some 6 or 7 feet long and high by 5 broad, very carefully constructed, with flat bands of thin iron on the outside covering the lines of junction of the planks, so as effectually to keep out both wind and moisture. Opposite the door, which we found carefully bolted, was a wooden shelf against the wall serving as an altar,

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on which stood a small bronze statuette of the Virgin, whilst on either hand hung the usual curious medley of votive paintings, engravings, crosses, tapers, &c., not to mention certain pious scribblings. Taking great care to disturb nothing, we arranged a loose board and our packs on the rather damp floor so as to form a seat, and waited for the clouds to disperse and disclose the superb panorama that we knew should here be visible.

Here I may be allowed (whilst referring my readers for fuller information to Ball's 'Western Alps,' and the interesting work of Louis Francesetti, Comte de Mezzenile, 'Lettres sur les Vallées de Lanzo,' Turin, 1823) to mention that a chapel, said to have been originally excavated in the rock, and subsequently buried under ice or snow, was here dedicated to the Virgin by a crusader of Asti, Boniface by name, of the house of Rovero, in fulfilment of a vow made whilst a captive in the hands of the Saracens. More recently the present wooden structure has taken its place, and every year, on August 5, pilgrims resort to it in considerable numbers. Lower down on the Susa side is a much more substantial structure, at a height of 9,396 feet, called the Cà d'Asti, in allusion to the circumstances of its foundation. This last is a solidly, not to say massively, constructed circular edifice of stone and mortar, some 15 or 16 feet in diameter, and perhaps rather more in height, with a vaulted roof of solid masonry covered externally with tiles, and surmounted by an iron cross. Seen from below, it stands out boldly on a mass of crags which conceal the actual summit of the Roche Melon, and close by are some low sheds, which appear ordinarily to serve as shelter for flocks of sheep browsing on the grassy slopes around, but, on the night preceding the festa of August 5, furnish sleeping quarters for the assembled pilgrims, who attend mass in the adjoining chapel, if the weather, as frequently happens, does not permit of its being celebrated on the summit of the mountain, in what is probably the most elevated shrine in Europe. There was, indeed, a very general local belief, before the ascent and measurement of Mont Blanc by De Saussure, that the Roche Melon was the loftiest summit in Savoy, and the inhabitants of the valleys of Lanzo and Susa are said to have still held this opinion as an article of faith at the time when Count Francesetti wrote. In 1821 its rank was definitely determined by the joint Piedmontese and Austrian commission, who selected it as one of the principal stations for connecting the arcs of the parallel of 45°, already determined between Fiume and Tessin, on the one hand, and the Tour de

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Cordouan near Bordeaux and the Rhone on the other. These gentlemen made repeated visits to this spot, and in the atlas of plates accompanying their well-known work will be found a very accurate engraving of the panorama. The height resulting from their observations is 3,533·6 mètres, or 11,593 feet, that determined by the officers of the État Major being 3,542 mètres, or 11,621 feet, and portions of the massive signal erected by them still remain as a record of their labours as well as of the fury of the elements which have ruined so solid a structure. For this peak stands just in the track of the great storms which, brewed in the heated plains of Lombardy and Piedmont, come surging up through the valley of the Dora Riparia, and burst, hurtling and crashing over the depression of Mont Cenis, to find or make a watery grave in the valley of the Arc. Of their combined fierceness and grandeur we were soon to have only too favourable an opportunity of judging, for scarcely more than five minutes after we had comfortably established ourselves under shelter, suddenly, without a moment's warning, a perfect mitraille of hail smote the roof above us, tore through the mist like grape-shot through battle-smoke, and whitened the ground like snow. We closed the door carefully, for now came flash after flash of brilliant lightning, with sharp, angry, snapping thunder, which, if we had been a quarter of an hour later, would have made our position on the exposed northern side anything but pleasant. We congratulated ourselves on our good fortune, but were glad to pitch our axes amongst the debris of rock above us and await patiently the hoped-for dispersal of the fog. In a few minutes the hail ceased, the mist became somewhat brighter, rifts appeared in all directions, and, issuing forth, we were amply rewarded by such glimpses of the wonderful view as, if not fully satisfactory for topographical purposes, were, in a picturesque and artistic point of view, indescribably grand and interesting. Such workings of the meteorological laboratory, such aerial conflicts, such tiltings between cumulus and stratus, and such marvellous colouring, I never saw before, whilst several thunderstorms—one just passing off in the direction of the Levanna, a second clamorously shrouding the Viso, and a third booming away in the direction of Cézanne and the Mont Genèvre—blotted out with their purple glooms segment after segment of the mighty circle of vision, peak after peak emerging, as their trailing skirts swept by, true

> 'mountains of the South,
> When, drunk and mad with elemental wines,
> They rend the seamless mist and stand up bare.'

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Above the Valle di Viù, especially, there hung a pall of 'darkness visible,' from which 'the flashing levin leapt to light,' whilst beneath its hail-torn, ashy-grey lower fringe, league upon league of smiling sunlit alp and cliff, and far-stretching plain, lay brightly gleaming in a perfect blaze of prismatic colour, so extraordinary, by force of contrast with its sable setting, that I could liken it to nothing less iridescent than mother-of-pearl. The extent of level country visible is a remarkable feature in the view from the Roche Melon, as also in that from the summit of the Pourri, where Imseng not a little amused me on first catching sight of the plains of France stretching away till lost in the haze, by shouting in a fit of uncontrollable enthusiasm, '*Ach! Das ist wunderschön!—ganz eben!*'

We had not had more than time enough to seize the general features of the panorama and admire the special effects with their ever-changing and kaleidoscopic combinations, when the mist once more swooped upon us, again to be followed by hail, lightning, and thunder, and a fresh clearance. But this second visitation left behind it a further souvenir in the shape of a phenomenon with which most mountaineers are probably more or less familiar, but which I never met with to the same extent before—I allude to an electrified condition of the summit of the mountain and all objects on its surface by conduction. As the clouds swept by, every rock, every loose stone, the uprights of the rude railing outside the chapel, the ruined signal, our axes, my lorgnette and flask, and even my fingers and elbows, set up

'a dismal universal hiss.'

It was as though we were in a vast nest of excited snakes, or a battery of frying-pans, or listening at a short distance to the sustained note of a band of cigali in a chestnut wood—a mixture of comparisons which may serve sufficiently to convey the impression that the general effect was indescribable. I listened, and looked, and tried experiments for some time, but suddenly it burst out with an energy that suggested a coming explosion, or some equally unpleasant *dénouement*, and, dropping my axe, to whose performance I had been listening, I fairly bolted for the chapel.

In an appendix to this paper I have collected a few notices from De Saussure, Forbes, &c., of this phenomenon, but must confess my ignorance as to whether the sound is caused by—to use popular language—a flow of the electric fluid into, or out of, the sonorous objects.

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We had now spent a couple of hours on the summit, and had succeeded in getting, bit by bit, a sight of most of the principal features of the very remarkable view, with the exception of Monte Viso, which persistently sulked; so at 1.15, as there seemed a probability of the weather becoming worse before it improved, we quitted our excellent shelter, and, after putting everything in order and carefully closing and bolting the door, sallied forth into the mist, which was again enshrouding the mountain, apparently as the advanced guard of the fiercest storm in the neighbourhood, which we had for some time been watching as it swept solemnly towards us down the valley of the Dora.

There is a sort of track, rather than well-defined path, down the bare, rocky, and debris-covered southern face of the mountain, but in the fog and momentarily increasing gloom of the coming tempest it was not always very easy to distinguish it. Still, we descended rapidly, and in less than half-an-hour had dropped down some 2,000 feet to a point where, during an instant's lift, we descried the outline of the Cà d'Asti five minutes below us, just as the edge of the coming hail smote us with a fury which it was hard at times to face. We dashed on —it was a regular *sauve qui peut*—blinded and staggering under the pitiless pelting and the fury of the blast, gained the door of the chapel, which faced the storm, deposited our axes outside, and darted in, thankful again to find ourselves under so good a roof just when it was most needed.

For, if there had been at times wild goings on upon the summit during the morning, they were merely a faint prelude to the elemental strife which now raged around. The wind roared and the hail hissed in fiendish rivalry, and yet both seemed silenced when the awful crashes of thunder burst above and about us. We were in the very central track and focus of the storm, and, as we sat crouched upon the floor, the ground and the building seemed to reel beneath the roar of the detonations, and our heads almost to swim with the fierce glare of the lightning. I had carefully closed the door, not only to keep the wind and hail out, but also because lightning is apt to follow a current of air, and, to the right on entering, at about the height of a man, was a small unglazed window some two feet square. Opposite the door was the altar, on the step of which I seated myself. Imseng took a place by my side, between me and the window, whilst Christian perched himself on the coil of rope with his back to the wall, not far from the door and between it and the window. A quarter of an hour may have gone by when a flash of intense vividness seemed

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almost to dart through the window, and so affected Imseng's nerves that he hastily quitted his seat by me and coiled himself up near Christian, remarking that 'that was rather too close to be pleasant.' Then came four more really awful flashes, followed all but instantaneously by sharp, crackling thunder, which sounded like a volley of bullets against a metal target, and then a fifth with a slightly increased interval between it and the report. I was just remarking to Christian that I thought the worst was past and that we should soon be liberated, adding, 'how fortunate we are for the second time to-day to get such shelter just in the nick of time,' when—crash! went everything, it seemed, all at once:

> 'No warning of the approach of flame,
> Swiftly like sudden death it came.'

If some one had struck me from behind on the bump of firmness with a sledge-hammer, or if we had been in the interior of a gigantic percussion shell which an external blow had suddenly exploded, I fancy the sensation might have resembled that which I for the first instant experienced. We were blinded, deafened, smothered, and struck, all in a breath. The place seemed filled with fire, our ears rang with the report, fragments of what looked like incandescent matter rained down upon us as though a meteorite had burst, and a suffocating sulphurous odour—probably due to the sudden production of ozone in large quantities—almost choked us. For an instant we reeled as though stunned, but each sprang to his feet and instinctively made for the door. What my companions' ideas were I cannot tell; mine were few and simple—I had been struck, or was being struck, or both; the roof would be down upon us in another moment; inside was death, outside our only safety. The door opened inwards, and our simultaneous rush delayed our escape; but it was speedily thrown back, and, dashing out into the blinding hail, we plunged, dazed and almost stupefied, into the nearest shed. For the next few minutes the lightning continued to play about us in so awful a manner that we were in no mood calmly to investigate the nature or extent of our injuries. It was enough that we were still among the living, though I must own that, at first, I had a fearful suspicion that poor Imseng was seriously wounded. He held his head between his hands, and rolled it about in so daft a manner, and was so odd and unnatural in his movements generally—so completely 'attonitus,' in short—that it struck me his brain might have received some injury. I, for my part, was painfully conscious of a good deal of pain in the region of

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the right instep, and I saw that one of Christian's hands was bleeding, and that he was holding both his thighs as if in suffering.

Gradually the storm drew off towards the Mont Cenis, and, with minds free from the tension of imminent peril, we had time to take stock of our condition. It was a relief to see Imseng let go his head and observe that it remained erect; to hear Christian say that his thighs were getting better; and to find, on examining my foot, that the mischief was nothing more than a flesh wound which was bleeding but slightly. My hat, indeed, was knocked in, my pockets filled with stones and plaster, and my heart, it may be, somewhat nearer my mouth than usual, but otherwise we could congratulate ourselves, with deep thankfulness, on a most marvellous escape from serious harm.

On comparing our impressions, Imseng declared that the lightning had entered through the window, struck the altar, glanced off from it to the wall, and then vanished, whilst Christian and I agreed in the belief that the roof had been the part struck, and the flash had descended almost vertically upon us. Quitting our place of refuge and repairing to the chapel, we encountered a scene of ruin which at once confirmed the correctness of our views. The lightning had evidently first struck the iron cross outside, and smashed in the roof, dashing fragments of stone and plaster upon us which, brilliantly illuminated, looked to our dazed and confused vision like flakes of fiery matter. It had then encountered the altar, overturning the iron cross and wooden candlesticks only three feet from the back of my head as I sat on the step, tearing the wreath of artificial flowers or worsted rosettes strung on copper-wire which surrounded the figure of the Virgin, and scattering the fragments in all directions. Next it glanced against the wall, tore down, or otherwise damaged, some of the votive pictures (engravings), and splintered portions of their frames into 'matchwood.' The odour of ozone was still strong, the water from the melting hail was coming freely through the roof, and the walls were in two places cracked to within five feet of the ground. In fact, as a chapel, the building was ruined, though showing little traces, externally, of the damage done, so that it is possible—unless a stray shepherd happened to look in—that its condition would for the first time become known upon the arrival of the pilgrims on the eve of August 5.

We stood long watching our departing foe, and then, three very sobered men dropped down silently and quickly that

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afternoon upon Susa, thinking of what might have been our fate . . . . but when one of us told the tale to a waiter, with some notion of preventing the lightning's destructive handiwork being set down to Protestant axes and hammers, the only remark he elicited was, '*è magnifico, signore!*'

APPENDIX.

The following quaint notice of the Roche Melon by Coryat, 'the Odcombean legge-stretcher,' as he calls himself, is the earliest with which I have met, and is extracted from the chapter in that eccentric worthy's 'Crudities,' which describes his journey from Lyons to Turin by 'the mount Senys,' in 1608 :—

'I observed an exceeding high mountaine betwixt Lasnebourg (Lanslebourg) and Noualaise, much higher then any that I saw before called Roch Melow; it is said to be the highest mountaine of all the Alpes, saving one of those that part Italy and Germany. Some told me it was fourteen miles high; it is covered with a very Microcosme of clowdes. Of this mountaine there is no more then a little piece of the toppe to be seene, which seemeth a farre off to be three or four little turrets or steeples in the aire. I have heard a pretty history concerning this mountaine, which was this: A certain fellow that had beene a notorious robber and a very enormous liver, being touched with some remorse of conscience for his licentious and ungodly life, got him two religious pictures, one of Christ, and another of the Virgin Mary, which he carryed a long time about with him, vowing to spend the remainder of his life in fasting and prayer, for expiation of his offences to God, upon the highest mountaine of all the Alpes. Whereupon he went up to a certaine mountaine that in his opinion was the highest of all the Alpine hills, carrying those two pictures with him, and resolving there to end his life. After he had spent some little time there two pictures more of Christ and our Lady appeared to him, whereby he gathered (but by what reason induced I know not) that he had not chosen that mountaine which was the highest of all, so that he wandered a great while about til he found a higher, which was this, unto the toppe whereof he went with his pictures, where he spent the residue of his life in contemplation, and never came down more. My authour of this tale of figment (for indeed so I accounte it and no otherwise) is our (guide) Maron of Turin, who horsed our company from Lyons to Turin, and told us this upon the way.'

In the description of his ascent of the Brevent ('Voyages dans les Alpes,' chap. xvi. vol. ii. p. 45) de Saussure writes as follows: 'J'ai éprouvé sur la cime de cette montagne une sensation bien rare, celle d'être électrisé immédiatement et sans aucun appareil par une nuée orageuse. J'étois monté sur cette cime avec feu M. Pictet et M. Jalabert en 1767. Dès que nous y fûmes arrivés, M. Jalabert se mit à dessiner la vue des glaciers. Pendant ce tems-là M. Pictet, qui s'étoit chargé de la partie géographique, levoit avec un graphomètre le plan

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de toutes ces montagnes; et moi, je dressois un appareil pour faire des expériences sur l'électricité, tant naturelle qu'artificielle. M. Pictet, à mesure qu'il marquoit sur son plan la position de quelque montagne, en demandoit le nom à nos guides; et pour la leur désigner, il la montroit du doigt en élevant la main. Il s'apperçut que chaque fois qu'il faisoit ce geste, il sentoit au bout de son doigt une espèce de frémissement ou de picottement semblable à celui qu'on éprouve lorsque l'on s'approche d'un globe de verre fortement électrisé. Il n'eut pas de peine à deviner la cause de cette sensation: la vue d'un nuage orageux, qui entouroit la moyenne région du Mont-Blanc, vis-à-vis duquel nous nous trouvions, lui fit penser sur le champ qu'elle étoit l'effet de l'électricité de ce nuage; il nous invita à essayer si nous l'éprouverions aussi; et nous sentîmes, comme lui, une espèce de frissonnement, tel que celui que produiroit un nombre de petites étincelles électriques; mais craignant encore d'être séduits par notre imagination, nous fîmes répéter cette même épreuve à nos guides et à nos domestiques, et ils éprouvèrent les mêmes sensations avec une surprise plus grande encore que la nôtre. Mais bientôt la force de l'électricité s'accrut au point de ne laisser plus aucun doute sur la réalité. La sensation devenoit à chaque instant plus vive: *elle étoit même accompagnée d'une espèce de sifflement.* M. Jalabert, qui avoit un galon d'or à son chapeau, entendoit autour de sa tête un bourdonnement effrayant, que nous entendîmes aussi quand nous mîmes ce même chapeau sur nos têtes; on tiroit des étincelles du bouton d'or de ce chapeau, de même que de la virole de métal d'un grand bâton que nous avions avec nous. Cependant l'orage qui grondoit avec beaucoup de violence dans le nuage qui étoit au-dessus de nos têtes, les éclairs qui en partoient à chaque instant, nous avertissoient de songer à notre sûreté. Nous quittâmes donc le sommet de la montagne et nous descendîmes à dix ou douze toises, où nous ne sentîmes plus d'électricité. Bientôt après il survint une petite pluie, l'orage se dissipa, et nous remontâmes au sommet, où nous ne trouvâmes plus aucun signe d'électricité.'

The late Principal Forbes when crossing the St. Théodule Pass in 1842 seems to have met with a similar phenomenon. At p. 322 of his classic work 'Travels through the Alps' he writes: 'The atmosphere was very turbid, the ground was covered with half-melted snow, and some hail began to fall. We were perhaps 1,500 feet below the Col, or still about 9,000 feet above the sea, when I noticed a curious sound, which seemed to proceed from the Alpine pole with which I was walking. I asked the guide next me whether he heard it, and what he thought it was. The members of that fraternity are very hard pushed indeed when they have not an answer ready for any emergency. He therefore replied with great coolness that the rustling of the stick no doubt proceeded from a worm eating the wood in the interior! This answer did not appear to me satisfactory, and I therefore applied the *experimentum crucis* of reversing the stick so that the point was now uppermost. The worm was already at the other end! I next held my hand above my head and my fingers yielded a fizzing sound. There could be but one explanation—we were so near a thunder-cloud as to be highly electrified by induction. *I soon perceived that all the angular*

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stones were hissing round us like points near a powerful electrical machine. I told my companions of our situation, and begged Damatter to lower his umbrella, which he had now resumed and hoisted against the hail shower, and whose gay brass point was likely to become the *paratonnerre* of the party. The words were scarcely out of my mouth when a clap of thunder, unaccompanied by lightning, justified my precaution.'

In the 4th volume of the '*Jahrbuch*' of the *Schweizer Alpenclub*, there is an interesting paper by the late Prof. G. Theobald on, 'Peculiar Phenomena during Storms in the Mountains.' After some preliminary remarks, the Professor proceeds as follows: 'On July 22, 1864, I ascended from St. Moritz, in the Engadine, in company with Messrs. Gruner and Stähelin, of Bâle, and a porter, the Piz Rosatsch (a peak 2,995 mètres in height rising immediately above the Baths) with the intention of thence passing over Piz Surlei to the Surlei Pass, &c., and examining these points geologically. After a very easy climb, rewarded by fine weather and a superb view of the Roseg Glacier, Piz Bernina, &c., we descended to a tolerably level depression in the ridge, and followed the latter towards Piz Surlei. At this moment a heavy mass of cloud approached from the direction of the Maloja, and soon enveloped Piz Surlei and our ridge, against which it boiled up from the west. Columns of mist rose perpendicularly, and sank slowly downwards on the other side towards the Rosegthal, where they were dissipated in the still dry atmosphere, whilst larger masses poured through the gap between us and Piz Surlei which last was now concealed. As yet these mists were without any discharge. Soon, however, high wind and heavy rain followed, and we sought shelter beneath some overhanging rocks. A brilliant flash of pinkish lightning and a short rattling clap of thunder in our immediate neighbourhood were the signal of a storm properly so called. Numerous hailstones of medium size mingled with the rain and covered the ground. Some ptarmigan sought shelter under the same cliff, but flew away as soon as they perceived us. Soon the wind shifted and chilled us with cold and rain. The latter, however, seemed somewhat to diminish, and, as an ascent of the Surlei was now out of the question, we once more made for the summit of the Rosatsch over which our retreat lay. As we traversed the rocky débris or deep snow in thick fog, the storm recommenced with renewed violence. Fierce flashes and simultaneous sharp cracks of thunder, like the reports of cannon, followed in rapid succession. We were in the midst of the storm-cloud. The electricity produced a fizzing sound in the points of our alpenstocks and hammers, but whether this was the effect of an outflow or inflow I cannot decide, though during the existence of the phenomenon I was inclined to the latter supposition. I could detect no appearance of light. I carried a stick with a pick-hammer and frequently, during flashes, experienced a strong shock in the hand which grasped it. Our hair rose up from our heads, and on the forehead where the silken band goes round the hat, we all felt a strong pricking sensation, probably because the silk, though itself wet, more or less interfered with the conductivity of the damp felt. All these phenomena were most highly developed when we stood

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apart, but if we drew close to one another, the buzzing of our batôns, for instance, which was audible at a distance of several paces, ceased entirely. Immediately after a flash, too, little or nothing was perceived, whilst the action reached its maximum during the interval between two flashes. The shocks in the arms were most powerful at the moment of the flash. The lightning at times seemed to strike the rocks and was very near to us, but the thick masses of cloud rendered it difficult to be sure on this point.

'By the time we had gained the saddle at the foot of the Rosatsch the phenomena entirely ceased, but reappeared with equal energy when we regained the summit of the peak, as we were here once more in the region of the storm-cloud. The rain now diminished, and after making various experiments confirmatory of our previous observations, we descended towards St. Moritz and were soon out of the range of the storm.

'Some years previously, a party of travellers who had reached the summit of Piz Languard in stormy weather, noticed a peculiar buzzing and singing of the metal flag there erected, and recognised in it the action of inflowing electricity, in which the point of the staff acted as a lightning conductor. Colani, the well-known Pontresina guide, has repeatedly made similar observations; M. de Saussure of Geneva informed me subsequently that in Mexico he had had a similar experience though of a far graver character; every ridge of rock and angle of stone fizzed, and the Indians who accompanied him fled screaming and howling, their long hair erect upon their heads. In the '*Jahrbuch*' of the *Alpenclub* for 1864 almost precisely similar phenomena are recorded (by Von Sonklar), and they have also been witnessed, accompanied by the appearance of light, by Professor B. Studer, if I mistake not.

'As respects one's presence in a storm-cloud, or its immediate neighbourhood, I believe it to be dangerous, especially if one happens to carry many metallic articles, such as hammers, botanical boxes, &c. Caution, therefore, is desirable in making experiments under such circumstances; but if the opportunity again presented itself, I should much like to apply some previously neglected tests, such as the action on the magnetic needle, and investigate more closely the question of the in- or outflow of electricity.'

ADDITION À LA NOTE PUBLIÉE DANS LE No XLIV DU VOL. VI DE L'*Alpine Journal*, PAR LE COMTE PAUL DE SAINT-ROBERT.

DANS une précédente communication, j'ai exposé une manière de mesurer la hauteur d'une montagne inaccessible au moyen d'une base verticale. Ayant appliqué depuis cette méthode à la mesure de la hauteur de la montagne nommée Tête de Moyse, dans les Alpes maritimes, à l'extrémité de la vallée de Maira, je me suis aperçu d'une circonstance que je crois utile de mentionner.

Des cinq angles, dont j'ai fait dépendre la hauteur à déterminer, quatre seulement sont nécessaires, et le cinquième peut se déduire des autres

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