

THE LYS JOCH AND ZUMSTEIN SPITZE FIFTY
YEARS AGO. By F. F. TUCKETT.

THE first expeditions to the Lys Joch on record date back as long ago as 1778, 1779, and 1780, when seven chasseurs from Gressonay, led by Herr Vincent, arrived at the watershed; again, on July 13, 1820, Zumstein, in the course of his five attempts (of which this was the second) to reach the summit of Monte Rosa by the Lys Glacier, gained the crest of the pass at a point which he calls the 'Entdeckungsfels' (see Zumstein's narrative in Von Welden's 'Monte Rosa,' pp. 122-138). As his narrative is of great interest, and has never, I believe, appeared in an English dress, a translation of the most important portions may be new to some of the readers of the 'Alpine Journal,' Mr. King's excellent *résumé* of Zumstein's different expeditions necessarily omitting many details which are worth preserving.

I must explain that Zumstein's earliest attempt, although unsuccessful, having convinced him of the practicability of the ascent, he resolved to renew it the following year (1820). The Academy of Sciences at Turin, desirous of securing some trigonometrical observations, provided an ample supply of instruments and an engineer, Molinatti, to conduct the survey. The first attempt, on the 26th July, was frustrated by the weather, but, nothing discouraged, the attack was resumed a few days later, and this time with better success. After describing his and Molinatti's bivouac at the Indren Huts, close to the glacier of the same name, he states that they started at 4.30 A.M. of the 31st July, 1820, and entered at once upon the glacier. After three hours, what he calls the 'second plateau' (below the Vincent Pyramide) was gained, and having traversed it, a halt was called, to allow the porters to come up and an observation to be taken. The height was 11,310 Paris, or 12,054 English feet. The narrative then proceeds as follows:—'Collecting my instruments, which the careful Jäger, Moritz Zumstein, assisted me to carry, we slowly traversed extensive snow-fields having an inclination of 15° to 20°. The unvarying monotony, and the fact that the sun had struck us and softened the snow, rendered the ascent laborious; the reflection from the glittering surface caused inflammation of the eyes, and two of our guides, the Tyrolese, were soon compelled to return, having already become blind.

'After two hours' march we at length reached the watershed (*Gränzscheide*) which extends along the great western

Kamm (Lyskamm) to the SE. summit (Parrot Spitze), and separates Piedmont from the Vallais. Here is also the entrance to the "*Krone*" or depression of the upper "*Eismeer*." In the view of Monte Rosa from Turin, it is clearly distinguishable. On the ridge near the western *Kamm* (Lyskamm) a tooth of rock pierces the snow. I shall name it the rock of discovery (*Entdeckungsfels*). From this rocky prominence a view is obtained to the NE. into the valley of Zermatt.

'In the years 1778, 1779, and 1780, seven chasseurs of Gressonay, led by Herr Nicolaus Vincent, father of my present comrade, and a respected inhabitant of the valley, came as far as this point. During three consecutive years they renewed the expedition, each time under the persuasion that they had discovered a new valley. The original source of this error was an old saying which, as the late Herr Vincent has himself often told me, is said to have existed amongst the old archives at Saas. According to this report, an alp, Hohenlauben by name, which formed a narrow valley, had in former times been overwhelmed by the union of two glaciers. In the last attempt only three of the party reached the "*Entdeckungsfels*," and these were at length convinced that the imaginary buried valley was in reality an inhabited Vallaisan pasturage.

'Here we halted, and casting a glance at the lost valley, I was at once satisfied that it was the Matter- or Niklaus-Thal with its surrounding glaciers. We were thus able to contradict the long-prevalent, hitherto so mysteriously obscure saying, as well as the suggestion of De Saussure, who observes: "I am convinced that the valley which they saw was that of the Pedriolo Alp, where we passed two nights on our ascent of the Pizzo Bianco." Even this *savant* could not unravel the topography of this little-known region. The Pedriolo Alp lies to the eastward, and the valley which the chasseurs professed to have discovered is in a westerly direction.

'Here we rested whilst waiting for the others. Herr Molinatti reached us, but in a very exhausted state. We remained a quarter of an hour, and refreshed ourselves with liqueur and good vinegar, which was later of essential service to us. Several porters were busy transporting in pairs a portion of our effects which had been left behind. We soon resumed our progress over the firm snow, and, though laborious, it was free from danger. No more crevasses showed their fearful edges. Only the eternal uniformity rendering all measures of distance by the eye utterly fallacious, and the increasing softness of the snow, caused us annoyance and increased the fatigue of the ascent. The two Herren Vincent and I first reached the

centre of the surrounding plateau. After a few minutes' rest, I set up the barometer and observed it carefully. Its reading gave a height of 13,230 Paris (or 14,100 English) feet, for the plateau on which we stood. The sky now began to cloud over, and mists drew up towards the summits from the gloomy depths around. My friends turned back to fetch Herr Molinatti. I remained alone in this solitude, still as death. For two full hours I wandered about this chaos in order to find a spot where we might conveniently pitch our tent and pass the night. A bare rock was nowhere to be seen beneath which we might hope to find shelter from the approaching tempestuous weather. My eyes long wandered around, but at length, on the northern slope of the great plateau, caught sight of a depression, to which I hastened. It was a crevasse which appeared to have a firm bottom at the depth of 10 *Klafter* ($62\frac{1}{4}$ English feet). I fixed upon this somewhat fearful chasm for our night-quarters, and returned joyously to the summit level of the plateau. The entire party had not yet arrived, and I had thus time to cast a glance at this world of eternal winter and to gaze at the numbness of nature. I also made use of the time to secure a hasty sketch of the scene. I saw myself surrounded by a semicircle of summits, of which I will by and by speak in greater detail. Three "Steinkrähen" hovered around one of the peaks. I remarked with pleasure that the summit which was our goal seemed to all appearance to be accessible. The great "*Eismeer*," the surface of which was unbroken by a single crevasse, was throughout its extent of the most spotless purity; not a withered leaf, some of which are usually met with on lower glaciers, transported thither by storms, flecked the beauty of the snow-plains. I nowhere observed the red snow formerly so frequently met with, and which often covers large tracts.

Meanwhile my friends arrived with some of the porters, who deposited their loads and then returned to help those behind. Herr Molinatti, after a short rest, hastened to set up his theodolite beside my instruments; but his labour was all in vain, for scarcely was it erected when the clouds closed over us and concealed alike near and distant summits, of which latter Mont Blanc, previously so distinctly seen, especially attracted our attention. To our great regret he could attempt nothing more with this splendid instrument, the transport of which had cost us so much trouble, as even some of the peaks of Monte Rosa which surrounded us were now concealed.

Night approached, and still no signs of our porters. A large portion of our effects, including the tent and firewood,

were still behind. We became alarmed, and the increasing cold added to our perplexity. It was 6 P.M., and the thermometer stood at -7° (no doubt Réaumur = 16.25° Fahr.). So rapid a change in the temperature, amounting to 15° (33.75° Fahr.) in so short a time, produced such an effect on me that I was already in a state of complete prostration. I had besides committed the imprudence of clothing myself too lightly, because on my former expedition I had suffered from the heat. Already the cold so penetrated me that my companions perceived I was growing pale. I lost all energy, and an irresistible drowsiness stole over me. The experienced chasseur, Joseph Beck, feeling anxious about me, began to shake me to warm my blood and restore defective circulation, by which means he soon set me to rights again. Meanwhile the cold continued to increase, and our perplexity was extreme. Our feelings may be imagined. At a height of 13,000 ft. (14,100 English) above the sea, with 10° of frost (= $22\frac{1}{2}^{\circ}$ of frost Fahr., or at 9.5° Fahr.), which was still on the increase, without any means of protection; without fire, on the eternal ice, and beneath the open sky; exposed besides to every description of stormy weather only too often encountered in these elevated regions. Only one acquainted with the upper ice-world can appreciate the danger to which we were exposed. We had already determined towards nightfall to beat a retreat, although there was no moon to light us, when at length the long-wished-for porters arrived, dragging their heavy burdens—tents, coverings, and wood. Imagine our joy! Light of heart, we collected everything together, and hastened to the crevasse selected for our night-quarters.

‘From the N. edge of the chasm a snow-slope, descending at an angle of about 25° , led down into its depths. Joseph Beck, the old chasseur, the boldest of the party, was the first to effect the descent, by means of about forty steps which he cut in the surface. After a careful examination he assured us of the solidity of the bottom, which indeed consisted of snow heaped up by the wind, and so the rest of us followed him. We were all penetrated by the most fearful cold, I half numbed, quite unable to observe the instruments, and not even capable of assisting in the erection of the tent, which the dauntless chasseur, Joseph Zumstein, raised with marvellous rapidity in the bitterest cold, whilst Marty set about preparing a cheerful fire, in which he succeeded after much difficulty.

‘Some capital soup was cooked, and served out all round, but eaten with little relish. We were eleven in party under the tent, and lay on our right sides, covered with blankets and

skins, and packed close together in a row, to prevent being frozen during the night.

‘ Thus we slept peacefully, resigning ourselves to our fate. In the middle of the night I was seized with fearful palpitation of the heart, and felt almost suffocated. I made my way outside, to recover breath, and the feeling of oppression having passed away in a few minutes, squeezed myself again between my companions, and slept till morning.

‘ At 3 o’clock we were awaked by a furious gale. Marty went out to light a fire and prepare some soup for breakfast, but at once encountered so cutting a blast, whirling the dry snow in clouds into the crevasse and upon our tent, that he was obliged to withdraw under its shelter. About 6 the wind fell, the intense cold diminished, and the pleasant sun greeted us in our *gîte*. All were now in movement, and we quitted the tent. None complained now of the discomforts of the night; only the two who had lain at the outside of the row suffered more or less from the frost.

‘ Whilst preparing to resume our progress, I observed the barometer and various thermometers, and deduced a height of 13,128 Paris (= 13,991 English) feet above the sea—about that of the Jungfrau in the Bernese Oberland (in reality more than 200 feet higher), and 1,158 feet (1,234 English) higher than De Saussure’s bivouac on Mont Blanc. So far as I know, therefore, no human being has ever passed the night at so great a height in Europe. The crevasse in which we slept was 5 *Klafters* (= 31 English feet) broad, and runs N. and S.; its upper margin is about 10 *Klafters* (= 62½ English feet) in width, and the depth is about the same. There was a fearful glimpse into a blue ice cavern at the SE. end. I entered it in order to observe more closely the strange spectacle, and went as far as was safe: the danger, as the sequel will show, being by no means small. The eastern wall of this crevasse descended perpendicularly to a fathomless depth, and was intersected by bands of various shades of colour and three to four inches broad, running from N. to S. The annual stratified deposits of eternal snow which these beds indicate were discernible to the number of 100, till the strata were lost to sight in the abyss. In the midst of this fearful vault glittered the most wonderful masses of snow in every conceivable fantastic form—cubes, rhomboids, triangles, columns, &c. These hung threateningly above us, so that we fancied every moment that we might be buried under their ruins. Beneath and around us lay the débris of geometrically formed pyramids, giving evidence of some strange disturbance. The reflection of the blue

ice made us all appear so deadly pale that we could not look at one another without a shudder. Chills seized us, so that we were compelled at once to quit the cavern, in which we should otherwise have liked to linger. We had penetrated about 200 paces and, from the rise of the superincumbent mass, had probably at the farthest point not less than 40 *Klafters* (249 English feet) of ice above us.

‘It was half-past 7, and all was ready for the start. I sent back some of the porters with a portion of our baggage. The rest followed us. For about half an hour we traversed undulating snow-fields, sloping gently towards the Vallais beneath the eastern summits of the Ludwig’s Höhe, Parrot Spitze, and Signal Kuppe, and then, ascending for about the same time, reached at length the base of the sharp pyramidal summit which we proposed to climb.

‘Herr Molinatti, exhausted by the rarity of the atmosphere, rested a little from time to time. The two Vincents, on the contrary, carried away by the utmost enthusiasm, hastened forwards to be the first to reach the top. I followed, panting, about fifty steps behind them. At length we stood at the foot of the snowy arête leading to the pyramidal summit. A snow saddle falling away sharply, stretched, as it appeared to us, in a SE. and NW. direction. The climb began, and the active chasseur Castel went ahead to cut steps with his axe in the ice to prevent us from slipping. The younger Herr Vincent followed him step by step. His brother and I soon overtook them, as the labour of step-cutting delayed their progress. Farther up, as we climbed the narrow ridge overhanging the Macugnaga Thal, the hard snow disappeared, and was succeeded by a coating of ice, which it required the utmost caution to traverse. Had we slipped, we should have fallen 8,000 feet sheer. It was fortunate, however, that neither of us was seized with giddiness. About ten paces below the summit we came upon rock much weathered, its cavities filled with ice, and, climbing over this with greater facility, we at length gained the summit. The younger Vincent was the first to set foot on it. He shouted, “Long live our King! Long live all patrons of science!” We took up the words, so descriptive of our feelings, and proceeded to plant a banner in the ice. It was just past 10 A.M. Two barometers were at once set up for the sake of comparison, and after a quarter of an hour read off by me with the utmost care. At length we saw Herr Molinatti approaching with some of the guides, and I sent back the chasseur Castel to assist him. As a precaution, a rope was fastened round his middle. Castel went first, having the rope

wound round his arm, and the brave Marty, holding him by the left hand, cleared out the steps for him. Thus, more dragged than walking, he at length reached us in safety.' Zumstein then describes how he observed that the summit they were on (the Zumstein Spitze) was not the highest of all. At 3 the descent was commenced; at 7 they regained the first plateau, and arrived just before nightfall at the huts. It will be seen that he gives 13,230 Paris, or 14,100 English feet as the height of the middle of the great plateau or 'Krone,' to which he continued to ascend from the Col. The plateau is clearly that bounded by the summits of the Zumstein Spitze, Signal Kuppe, Parrot Spitze, and Ludwigshöhe, and its elevation does not certainly much exceed that of the Col itself. There appears, however, to have been some error in Zumstein's mode of calculation, since he deduces for the Zumstein Spitze a height of 15,092 feet, whilst Delcros, recalculating his observation, reduced it to 14,980 feet, and the Federal surveyors give it as 15,004. Assuming that these last are correct, we get an error in excess, or a correction, of 88 feet, and, deducting this from 14,100, the height of the plateau, which is about the same as that of the Col, comes out 14,012.

A careful barometrical observation of my own, calculated by comparison with the St. Bernard (which, by the bye, probably gives more accurate results than when Geneva is taken for the lower station, as explained by Plantamour in the interesting memoir with which he has enriched our library) gives for the Lys Joch, by the tables of Delcros, a height of 14,053 feet, whilst the mean boiling point of two excellent thermometers by Casella, whose readings differed only by $\cdot 15$ of a degree Fahrenheit, converted by Regnault's tables into terms of barometric pressure, varied from the barometer by the small amount of 0.4 millimètres, or 0.016 inch, reducing the height to 14,028 feet. I refer to these results, although already quoted by Mr. Mathews in his paper on the Lys Joch ('Peaks, Passes, and Glaciers,' 2nd series, vol. i. p. 381), because it is a little singular that in the case of so frequented a pass, so few hypsometrical observations have been made, and even the Federal Map and the still more accurate and minute 'Excursion Map' of the Swiss 'Alpenclub' convey no information on the subject.