

EXCURSIONS IN THE GRAIAN ALPS. THE ASCENT OF
THE STE. HÉLÈNE. By R. C. NICHOLS.

THE hasty visits which I paid to the Graian Alps in 1863 and 1864 served at least to show me how much remained to be explored in this region, and how imperfectly its topography had hitherto been described or delineated. I therefore gladly seized the opportunity which presented itself last year, of commencing the campaign earlier than I generally have been able to do, and left London in the middle of July, with the intention of devoting six weeks to this district, in which time I hoped to make a fair bag of new peaks and passes, and, moreover, to do some good work towards the correction of the map. There was one proviso, however, in this programme, 'weather permitting;' and I could almost believe that the authorities who regulate this department in Piedmont must be, in some way, connected with the Bureau Topographique of that country, so admirably did their arrangements appear to be designed for the purpose of screening the errors and deficiencies of its work. I arrived at Aosta on the 20th of July, and on leaving on the 20th of August in despair, to solace myself for the brief remainder of my holiday in inglorious repose at the Italian lakes, I found by my bill at the hotel Mt. Blanc that I had passed there twenty out of the intervening thirty-one days.

I was met by Victor Favret at Martigny, and we passed the St. Bernard Hospice at 8 o'clock on the evening of Wednesday, the 18th of July. The sun had set, but I pressed on to St. Rémy, in order to make an early start on the following morning. I had noticed in the Federal map a point marked as a station, and called Mt. Fallet (in Carrel's panorama Mt. Falère), the culminating point of the mass of hill lying between the St. Bernard and Aosta. From its position, raking all the valleys on the south side of the Val d'Aoste, as well as that valley itself, and the Valpelline, it was evident that it would command a view of no ordinary character, and I purposed visiting it in my way to Aosta. Taking the short cut from the hospice by the left side of the valley, I reached St. Rémy at 9.10, and half-an-hour before the mule carrying my baggage, which descended by the usual route. My arrival after nightfall created no small stir among the douaniers, and my baggage, when it did arrive, with its ropes, packets of soup, &c., was evidently regarded as more than ordinarily suspicious. At length, however, it was allowed to pass, and I retired to rest. The morning was cloudy, but we started at six, with some hopes of obtaining a view. We

crossed the stream at Cerése at 6.30, and ascended the little lateral valley immediately opposite, called in the Federal map Combe de Frassin. At 10.25 we reached the col, and came in view of the Graian Alps. The summits were mostly covered with cloud, but I could see enough to confirm my expectation of the magnificent view to be obtained in clear weather. It would have required at least an hour and a-half to reach the top of the peak, and this could not have been done without descending and re-ascending. As this would only have been labour thrown away in such weather, I descended to Aosta. I went up to the Hermitage of S. Grat on Saturday, and sketched the valley. I prepared for an early start on Monday morning, but it rained heavily during the night, and the morning was unpromising. At 3 P.M. I started for the chalets of Sarre at the foot of Mt. Fallet, and reached them at 7.40. I was provided with a bed—with the usual accompaniments—consequently slept little, and was glad to rise at three. The weather was cloudy. We started at six, and at a quarter to eight were within $\frac{1}{4}$ hour of the summit, and waited to give the clouds a chance of clearing, went on to the top at nine, and remained there till eleven, when the clouds and mist began to turn to rain, and we descended. No sign of improvement appearing, we returned to Aosta. Thursday was thoroughly wet. On Friday I went up to Comboe, with Mr. Taylor and Professor Adams, who had arrived at Aosta the preceding evening; we intended to continue our walk to the Becca de Nona, but the clouds enveloped it, and it was useless to proceed; we had a pleasant hour's chat with Canon Carrel, and returned to Aosta. I tried to induce my companions to join me in an excursion to the Val Grisanche, but I could not persuade them that there was ever fine weather in these regions, and they started next morning for Switzerland by the St. Bernard.

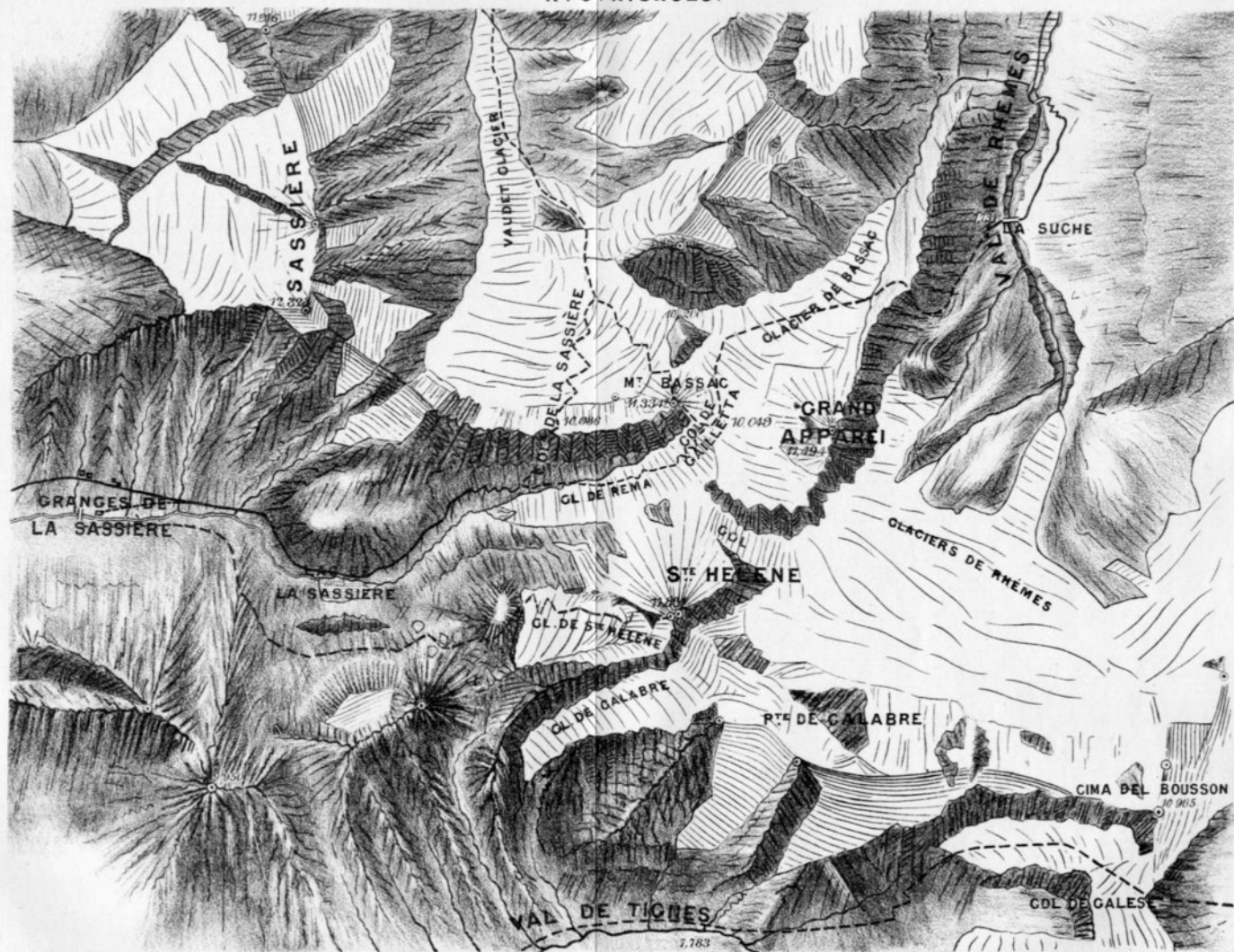
On Friday, July 28, Favret und I left Aosta for the Val Grisanche. I had arranged to meet Messrs. Blanford and Rowsell at Brides les Bains, near Modtiens, on the 31st, so that I had not much time to spare. At Ivrogne we picked up a porter named François Rollet, of Arvier, and walked up the valley to Fornet, where the path to the Col du Mont turns off to the right, and took up our quarters for the night at the house of M. Chamonin, the brother of the well-known mountaineer, the Curé of Cogne. The accommodation was of the roughest; my host and his family did their best to make me comfortable; still the contrast with my late quarters at Aosta was too decided

to allow me much sleep, and I was glad to rise at two next morning, and set out by bright starlight at three for the Ormelune. This mountain lies on the west side of the Val Grisanche, between the Cols du Mont and Vaudet. It has, as I afterwards discovered, three peaks, that to the east being somewhat lower than the other two. We followed the path towards the chalets of Vaudet for a little more than an hour after leaving Fornet, then crossed the stream to the left bank, and passed the chalets of Ponton at 4.35, and about five minutes later began ascending the steep hill-side near the waterfall which descends from the Col Vaudet. In about half-an-hour we came upon the path leading to that col. Up to this time the sky had been without a cloud, but with the rising sun came up the mists from all the valleys, and, before we had reached a point whence our peak could have been seen, it was, with all the neighbouring mountains, shrouded in clouds. We had ascended to the top of the ridge north of the Col Vaudet. On the opposite side this ridge fell in a precipice to another little valley, leading to another col, at about the same height; beyond we could see nothing. After waiting some time, we found a way down the rocks and across some snow-beds to the further col. It was marked, as are all the practicable cols in this neighbourhood, with a French boundary post; but, as I am not aware that it has yet been named, I propose to call it the Col d'Ormelune. Its height, which differs little from the Col Vaudet, I calculate, from a sympiesometer observation, to be about 9,580 feet. After another long halt, we thought we saw signs of improvement, and, starting in the direction in which we knew our peak must lie, we ascended easily over fields of broken stone and snow, changing to a small glacier; and, finally, a short scramble up some rocks led us to the summit, which we reached at 9.50. The sky had by this time partially cleared. We soon saw that we were overtopped by another peak, about 400 yards to the north-west. The arête connecting it with that on which we stood was, however, quite impracticable. It appeared about 100 feet higher, and to ascend it, a very considerable circuit, first descending and then re-ascending, would have had to be made, which would have occupied the time I wished to employ more usefully; so I contented myself with my position, and the more readily as the east peak gave me a view of the Val Grisanche, which the further point would not have afforded. I sketched, as far as the clouds would permit, the panorama from the Ruitor to the head of the valley. The Sassièrè remained obstinately hidden, but I obtained at intervals nearly the whole of the ridge on the

opposite side of the valley, including the Invergnouon, and the Ste. Hélène, the top of which only was seen over the ridge at the head of the Vaudet glacier. This occupied me till 12.40. The height of the peak by my sympiesometer, compared with Aosta, appears to be 10,796 feet. In descending we reached the col at 1.5, rested there till 2.20, and then went on to the chalets of Vaudet, where we arrived at four o'clock, and found shelter with Jean Marie Ponton, whose name I registered as a very good and obliging fellow. I was thoroughly tired, and slept well in spite of all difficulties.

The morning was again bright and clear. We set out at 4.50, and ascended the glacier. With only one halt of barely ten minutes, at the moraine at the top of the island of rock, in order to put on the ropes, we proceeded to the summit of the little peak, marked on the Sardinian map as the Bric de la Traversière, but called by the *bergers* of Vaudet Mont Bassac, arriving at 8.15. My observations made its height 11,334 feet, but I believe this to be somewhat above the mark. It is, however, most admirably situated for a view, and there is scarcely a mountain of importance, either in the Pennine or Northern Graian Alps, which is not seen from it. All these were without a cloud at the moment of my arrival, but, alas! I had scarcely time to take the bearings of the principal peaks before the envious vapours arose and concealed a great part of them from my view. I got a panorama, though an imperfect one, as, bit by bit, first one peak and then another became visible, and worked hard till nearly half past one, when we began to descend. The peak has three arêtes; the one by which we ascended leads north to the Col Bassac, another, which is impracticable, west towards the Sassièrè, and the third by which we descended, south-east to the top of the Col de Gailletta. On the other flank of the col should be, according to the Sardinian map, the Grand Apparei. No mountain, however, actually occupies this position, but an insignificant peak, rising little higher than the col itself, upon the ridge dividing it from the lower glaciers at the head of the Val de Rhêmes. A short distance north of this point, on the same ridge, rises the Grand Apparei, which we ascended in 1863. South of it is a col, probably practicable, leading down to the lower glaciers, and if so, affording an alternative route from Tignes to the Val de Rhêmes. Then rises, with a steep slope of about 50°, the fine peak of the Ste. Hélène, inaccessible on this side, but, as I now perceived, practicable on the south-west; and we satisfied ourselves that, in all probability, we should have little difficulty in reaching its summit from that

SKETCH MAP
 OF THE
 GRAND APPAREI & ST^E HELENE,
 BY
 R. C. NICHOLS.



0 1 2 Miles

quarter. There was one bit of rock in the arête which appeared to present a difficulty, but in the course of our descent we had decided on the exact route to be taken, and I was sorely tempted to steal a march on my friends and take advantage of the favourable weather for trying it the next day. I resisted the temptation, however, but resolved that this part of our programme, at least, should, if possible, be carried out before many days. We reached the top of the Col de Gailletta without difficulty in 25 minutes, and descending the Glacier de Réma, passed the little lake and chalets of La Sassièrè, and reached Tignes at six o'clock, having made a halt of about an hour and a-half by the way.

I found the little inn at Tignes better and more reasonable than previous travellers had done. The last was perhaps in part owing to a hint given to them by Favret, that I had heard of their character for extortion, and was not disposed to submit to unreasonable demands. I left at 5.25 A.M. the next morning, and ascended to the Col de Tignes, intending to cross the Col du Palet. But, misled by the map, I followed a little valley which led me to the south of that col, and to the other side of a remarkable little conical peak, which has at present, as far as I am aware, no name. As there seemed no reason why another pass should not be made here, we persevered in the same direction, and after ascending a small glacier for a short distance, reached the ridge overlooking the Montagne of Plantrin, at the head of the Val Prémou, at a height by the sympiesometer of about 9,700 feet. I congratulated myself in having attained a better point of view than would have been afforded by the Col du Palet, and occupied the time till five minutes to two in sketching the panorama, which remained throughout clear and unclouded. I propose to call this col the Col de Plantrin, and the little peak near may be called the Pic de Plantrin. The view from that point would be still finer, as it would include the Mt. Blanc range, and, in the opposite direction, the peak of the Grande Motte, both of which are hidden at the col.

I had only a vague notion of the distance from hence to Brides. A chasseur, who paid us a visit just before we started, told us 8 hours; the 'Alpine Guide' I found to allow $7\frac{1}{2}$ from the Col du Palet. Either would make us rather late; so we made a rush, descended a couloir of rolling stones to the pastures of Plantrin in half-an-hour, and thence as hard as we could go to Brides, which place we reached at 7.35. We stopped at the Ancien Établissement, where we were well cared for by the worthy Dr. Saissus and his assistants, who

told us that, though they did not profess to entertain ordinary travellers, they were glad to make an exception in favour of mountaineers.

Within half an hour of my arrival I was joined by Blanford and Rowsell. Our retinue was increased by a porter from Chamouni, named Frasseron, in training for a guide, and who will make, I doubt not, a very good one. My porter, François, alarmed, I think, at the appearance of our baggage, struck, and returned home; so we picked up two local men to assist. The next day was devoted to rest, and the three following lost in going up to, and waiting at, la Motte, at the foot of the Col de Chavière, in the hope of being able to explore the glacier-field between Pralognan and the Dent Parassée. Driven back at last by a snow-storm, we resolved on returning to Moûtiers, and crossing the Little St. Bernard to Aosta.

A brilliant morning, on the 6th of August, at St. Didier, tempted us again towards the mountains, sending the greater part of our traps on to Aosta. We set off for the Val Grisanche, intending to sleep at the chalets of Vaudet, but a short cut over the mountain of Derby occupied us so long that we had to remain for the night at the house of the syndic at Serré. Here we were really very comfortable, and our worthy host would hardly accept so much in payment as we thought right to pay. I ought not quite to pass over this day's work without remarking that the bird's-eye view of the valley obtained from the height by which we approached it disclosed a remarkable feature in its structure. I have before observed on the extraordinary distinctness of the glacier traces in this valley. From above, it was seen to exhibit these traces on the large scale, as well as in the small, being scored out into several parallel grooves, divided by rocky ridges, which are *moutonnées* on the top, extending in the direction from the Ruitor towards the mouth of the valley.

The next morning we set out at ten minutes after five. We found the inn at l'Église shut up, so we were obliged to content ourselves with what provisions we could get at Fornet. We made a halt at the chalets of Vaudet, and started again at 9.30. We then went on up the glacier by the route we had previously followed, diverging at the moraine and directing our course towards the lowest point of the nearly horizontal ridge at the head of the glacier. In the last part of the ascent we found it necessary to keep a little to the left of the point for which we were aiming, and after cutting a few steps, reached the arête at 2.15. We had occupied $4\frac{3}{4}$ hours in reaching a position very little distant from, and somewhat lower than, Mt.

Bassac, which I had reached in less than $3\frac{1}{2}$ hours. Blanford had brought with him an excellent mountain barometer, and by comparison with Aosta we found the height of the col to be 10,896 feet. The day was dull and cloudy, and our first thought was of the descent. A steep couloir led downwards from the natural col, a little on our right, the upper part of which was reported by Favret as dangerous, if not impracticable. But from the point where we stood it appeared possible, with care, to descend into this couloir, joining it about 60 feet lower. We left the summit at 2.50, and soon got into the couloir, after which our route became easy, and we stood at its foot, immediately above the lower end of the Glacier de Réma, at 4 o'clock, and reached the chalets of la Sassièrre at 5.50.

We found the herdsmen established in the upper chalet, but were told that we could best be accommodated in the lower one, about 600 yards off, where there was some hay. A marmite, bowls, wooden spoons, and other necessaries were accordingly borrowed, and the patriarch of the *bergers* insisted on accompanying us; and whether he thought that we might run away with the montagne, or whether solely to fulfil the duties of hospitality, he favoured us with his society during the whole of our stay.

The clouds seemed to be clearing off, and we had good hopes for the morrow, but these hopes were doomed to disappointment. When the morning broke, a strong wind was blowing from the west, and driving a dense mist up the valley and around us. We were unwilling to abandon the Ste. Hélène without an attempt, and determined on remaining another day, sending Favret down to Tignes for provisions.

I need not enlarge on the delights of a chalet in bad weather. We endeavoured, without perfect success, to resist the depressing influences that surrounded us. Our ancient host was unremitting in his attention, and did his best to enliven us with his society and conversation. The intelligible portion of the latter presented but little variety. It ran somewhat in this strain: 'Chauffez vous, mes amis, chauffez vous; venez vous ici auprès du feu, chauffez vous; nous sommes ici dans un pays des montagnes, nous ne sommes pas dans les plaines; chauffez vous, mes amis,' and so on, *ad libitum*. It was for some time hard to say whether we were most bored or amused by the old man's continual reiteration of this song, but I think on the whole the effect was salutary, and each new repetition of 'Chauffez vous, mes amis,' dissipated a little of the gloom which surrounded us.

But we were much more cheered about three or four in

the afternoon by a change in the wind from W. to N., and a partial dispersion of the clouds. This improvement continued, and before dark we were able to see and sketch both the Ste. Hélène at the head of the valley, and the more distant Glacier de Casse and Glacier de Nootte, which so finely closed in the view at the other extremity. We retired to rest at an early hour with stronger hopes of a favourable day, and on this occasion our expectations were answered by the event. At 2 A.M. we were roused by the welcome announcement that there was not a cloud in the sky. The moon was nearly as bright as day, and we had only to make our preparations as quickly as possible, and start on our expedition. At 3.20 we set off for the Ste. Hélène, crossing the stream close to the chalet, and keeping up the left bank of the stream till we approached the lake, when we commenced ascending towards the right. A high ridge terminating in three rocky peaks, at the base of one of which is a small glacier with an enormous moraine, separates the valley from the upper part of the Val de Tignes. We passed a good deal of rough rocky ground, and two or three little tarns, and then, after a short sharp ascent, reached at 5.45 the foot of the glacier which fills the hollow of the Ste. Hélène. The lower part was smooth hard ice, and little crevassed. We had to cut steps for some distance on account of the steepness of the angle, but soon reached a more level portion, and were able to get along at a good pace. We were soon upon snow which was in good condition, and we rapidly approached the *bergschrund*, which defends, as usual, the last peak. Here steps had again to be cut. We had no difficulty in passing the crevasse; above it the ice was very steep. Our progress was necessarily slow, and the shattered rocks of the western arête on our left appearing easy, some one suggested our taking to them. On nearer inspection their appearance was not so favourable. We kept for some distance along the line between them and the ice, and when on reaching an apparently favourable couloir we commenced ascending them, we soon found it better to betake ourselves again to the middle course. This was a sort of continuous *cheminée*, one side being rock and the other ice, but when we had passed the projecting spur which appeared from the Glacier de Réma below so formidable an obstacle to the ascent, the rocky ridge on our left suddenly changed to a slope of *débris*, over which we soon scrambled to the arête. This was, itself, broken almost into a flight of stairs, and in ten minutes more, that is, at a quarter to nine, we stood upon the top of the mountain. We found it to consist

of two rocky peaks, scarcely rising above a level arête of snow which connects them, in length about 50 yards, and running nearly ENE. and SSW. The eastern or further summit was a few feet the highest. First crossing to this we set up the barometer, which read 19·426, temp., 40°, air, 30·2°, giving by comparison with Aosta 11,861 feet for the height of the mountain.*

We then returned to the western peak, which afforded more space for rest. The view was glorious; not a cloud appeared, except a level stratum far below us, which covered the Italian plain, and filled the Val Locana to the east. A complete panorama would have been very desirable, but the enormous quantity of detail made this impossible in the time we could spare. I set to work on the part which was newest to me—the extensive and complicated glacier district stretching southwards towards the three fine peaks of the Séa, the Albaron, and the Chardonnet, and including the site of the Mt. Iséran of the Sardinian maps. To draw this carefully occupied me for four hours, and after a few hasty sketches of other points it was time to think about descending; my companions, meanwhile, found it rather cold. We continually exhorted each other in the words of our old friend below, ‘*Chauffez vous, mes amis, chauffez vous.*’ Our guides very wisely took to warming themselves by the erection of a stone man, by which they soon converted this lower peak into the higher by several feet, and earmarked this mountain for us, as we had previously done with the Grand Appareil. That peak now appeared far below us and almost at our feet, and we congratulated ourselves on having at last accomplished the conquest of the terrible-looking pinnacle whose superiority had so much disgusted us two years before. At 1.20 we left the summit; our descent over the broken rock arête required care, and occupied longer than the ascent. We followed nearly the same line as we had done in the morning, and keeping more to

* Since writing the above, I have seen a photograph of part of the unfinished map of the French Bureau Topographique. The *Ste. Hélène* is not very accurately represented, but upon the point apparently intended for the summit is figured the height 3,606 metres or 11,831 feet. The following heights from the same authority will be interesting:—

	Metres	Feet
Sassière . . .	3,756	12,323
Col de Gailletta . . .	3,063	10,049
Tignes . . .	1,659	5,433
Chardonnet . . .	3,760	12,336
Pourri . . .	3,788	12,428

the left at the foot of the glacier, and so avoiding the steep part, reached the moraine at 3.20. Here we halted half-an-hour, and then speeded on to the chalet, where we arrived at 5.25.

The night was fine, but the morning rose red and threatening, and the clouds soon began to gather. We started at 5.35 for Aosta by the Col de Gailletta. We should have wished to try the apparent col between the Ste. Hélène and the Apparei, but as we approached the top the clouds and rain came down upon us, and we thought it more prudent to keep the usual route. We reached the col at 8.17, and the moraine at the point where we left the Glacier de Bassac, at 9.10, descended to the chalets of la Suche in half-an-hour, and thence, without further adventure, in nearly constant rain, made our way down the Val de Rhêmes, and were not sorry to get into a trap at Villeneuve for Aosta.

From this time till the 20th of August, when we left, the weather continued almost constantly bad. One fine day tempted us up the Val de Cogne to the chalet of Monei, but a return of rain sent us back again without having done anything. One day we were able to get up to Mt. Fallet. Not being inclined to repeat my experiences of the chalets of Sarre, we started at 4.30 A.M., passed the chalets at 7.30, and after half-an-hour's halt, reached the summit at 10.10. This was my second ascent, and third attempt this year, and for the first time I was able to get a view, though only a partial one, over the Graians. As a point of view, I think this peak better even than the Becca di Nona, and for a pedestrian it is as easy of access from Aosta. The Pennine chains remained totally obscured during our stay, and I was especially disappointed at not obtaining any view up the Valpelline. I sketched as much as I could see of the Graians; we remained at the top till 3 P.M., and descended to Aosta in 4½ hrs., including 40 minutes' halt at the chalets. This was our last expedition. The weather continued unfavourable; my companion had to be back in London at the beginning of September, and I also was unable to prolong my stay many days further.

P.S.—The map appended to the foregoing paper may be taken as approximately correct for the Grand Apparei and Ste. Hélène, but still requires some corrections on the ridge between the latter peak and the Col de Galèse. There appears to be a practicable col across this ridge from the Val de Rhêmes to the head of the Val de Tignes, between the Ste. Hélène and the Cima del Bousson. I could not, however,

ascertain whether it had yet been traversed. I learned, this year, from M. Chamonin, of Cogne, that the mountain on the north of the Col de Bassac, as well as that to the south is known as Mt. Bassac. It may be convenient to distinguish the latter (that so named on the map) as the Petit Mt. Bassac. The Col de Bassac is not named on the map, but is marked by the figures 10,200. M. Chamonin also informed me that there was a second col on the north of the former mountain leading direct from the chalets of la Sassièrè to Barmaverin, which is also known as the Col de Bassac. Its position would be nearly at the northern limit of the map.

I regret that this sketch map should be less accurate and complete than, with further information, I might now have made it. It was prepared somewhat hurriedly in August last for the September number of the *Journal*. The delay in its publication enables me to add this explanatory note.

Nov. 14, 1866.

R. C. N.

ON THE SYMPIEZOMETER AND ANEROID BAROMETER.

By W. MATTHEWS, M.A.

THE use of the mercurial barometer in the measurement of heights has been explained at length in a former number of the *Alpine Journal*. The cumbrous nature of this instrument, and its liability to fracture, have proved such serious drawbacks, that the ingenuity of instrument-makers has for many years been exerted in attempts to devise some equally trustworthy but more portable contrivance. A number of substitutes, all more or less unsatisfactory, have thus been constructed, and the subject can scarcely be considered complete without a description of the most important of these substitutes. They divide themselves naturally into two classes: first, those in which the atmospheric pressure is measured directly; secondly, those in which the subject of direct measurement is some other physical property, such as the temperature of the boiling-point of water, which depends upon the atmospheric pressure, and from which it may be inferred. The first class includes the Sympiezometer, and the various descriptions of aneroid or non-fluid barometers; the second, the Thermo-hypsometer, or boiling-point thermometer. The first class of instruments only will be treated of in the present paper.

The sympiezometer was first constructed several years ago, by Messrs. Adie and Son, of Edinburgh and the Strand. It