Vallon de la Bonne Pierre and Les Ecrins; we also made out the Col de la Casse Déserte, the descent from which appeared practicable though difficult. Shortly after, a few patches of grain were seen on the left bank of the stream, and then the huts of La Bérarde appeared below. Here we arrived at 5.50, and were hospitably received by the Rodiers. The evening was lovely, and we lay on the grassy hillocks watching the rosy tints of sunset fading through every gradation into the tender purples of a summer's night, as star after star shone out in the darkening sky.

After an undisturbed night on new hay in the well remembered *grange*, we crossed, next day, the Col du Sélé to Ville de Val Louise in 9 hours' actual walking. After the excellent description given by Mr. Tuckett, I need only say that the diminished quantity of snow made the pass more difficult than he found it; the rocks near the top being rather troublesome. The scenery, however, surpassed our utmost expectations.

NOTES AND QUERIES.

DISCREPANCY BETWEEN FRENCH AND ENGLISH BAROMETRIC STANDARDS.—I would draw the attention of the Alpine Club to an apparent anomaly between the heights of the French and English barometers compared with the boiling-point, as given by the best authorities, which I have been at some pains to investigate.

Boiling-point.	Barometer. inches. mm.		Barometer. inches. mm.
212° Fahr. or 100° Cent.	= 29·905 or 759·58 as given by the Kew Committee of the British Association.	=	29·922 or 760· as given by Regnault in his tables of the elasticity of vapour, and adopted by Guyot in his tables.

A boiling-point thermometer, therefore, compared and adjusted at Kew, will not be *precisely* accurate when compared with Guyot's table, but will require the addition of 0·0283° Fahr. = 0·017 inches of the barometer. The larger portion of this discrepance arises from the difference of the standard temperature of the scale of the English and French barometers; the remainder is accounted for by the difference of latitude producing a variation of gravity.

First, as to the discrepance arising from the standard temperatures. That of the English barometer being 30° Fahr. higher than that of the French scale: when the mercurial column is reduced to the freezing point the scale of the French barometer is also reduced to the freezing point, but the scale of the English one is only reduced to the temperature of 62° Fahr. The consequence is that the French barometer, when reduced, will always read higher than the English barometer.

Let A be the height of the barometer observed;
B the linear expansion of brass for 1° Fahr. = ·0000104344; as given by Laplace and Lavoisier; or ·000018782 for 1° cent.
The French barometer, when reduced, will, on account of the difference of standard temperatures, read higher than the English barometer by an amount = 30 A B; e. g.:

B = ·0000104344 = log. $\bar{5}$·018467
A = 29·905 in. = log. 1·475743
30 = log. 1·477121
$\bar{3}$·971331 = ·009361 excess of French reading. (inches.)

By changing A it will be evident that we get the excess for any height of the barometer; but for the average height at the sea-level it may be taken as ·009 inches.

For exact observation, therefore, it is useless to have a barometer marked with a double scale, the French and English: they *cannot* be made to coincide, e. g.:
Let the barometer read 29 inches = 736·59 mm. (temp. 62° Fahr. = 16·67° cent.).

In the English scale at 62° (the temperature of the standard) no correction is made for the brass scale. The only correction is for the expansion of the mercury —·087.

29· inches
— ·087
reduced 28·913 = 734·38 mm.

But in the French scale, the temperature of the standard being 32° Fahr., the correction to be made is, for the expansion of the mercury — the expansion of the scale:

Expansion of the mercury for 16·67° cent. = 2·212 mm.
Expansion of brass scale for ditto = — ·231
1·981

736·59 mm.
— 1·981
reduced 734·61 = 28·9224 inches.

To reduce the barometer to the freezing point we have then the following formula:—

Let M = the cubic expansion of the mercury for the number of degrees centigrade, or Fahr., by which the observed temperature differs from the freezing point.
B = the linear expansion of the brass scale for the number of degrees by which the observed temperature differs from the standard.
H = the observed height of the barometer, in inches, or millimetres.

The formula for the reduction of the English barometer will be:—

above 62° Fahr. — (M — B) × H.
below 62° and above 32° — (M + B) × H.
below 32° + (M — B) × H.

For the reduction of the French barometer :—

above the freezing point $-(M - B) \times H$.
below the freezing point $+(M - B) \times H$.

By the difference in the standard temperatures we can thus account for ·00936 inches out of the ·017 by which the Kew equivalent to the boiling point differs from that of Regnault. This remainder is almost exactly accounted for by the difference of gravitation.

The increase of gravitation, i.e. gravity as diminished by the centrifugal force, is from the equator to the pole = ·0052005, or ·00260 to the 45th degree of latitude.

Adopting the law that it increases as the square of the sine of the latitude, we find that in 51° 30′, the latitude of London, the increase of gravity is = ·0031852; in latitude 49°, that of Paris, the increase of gravity is ·0029621.

Let D be the difference of these two gravities = ·0002231.
B the height of the mercurial column at London equivalent to a given pressure.
B′ the corresponding height of the mercurial column at Paris.
B′ will be $=(B+BD)$, e.g. :—

Gravity in lat. 51° 30′ = ·0031852 —
Gravity in lat. 49° = ·0029621

Difference . 0002231 = D = log. $\bar{4}$·348305
29·905 = B log. 1·475744
$\bar{3}$·824049 = ·006688 = BD

To compare, therefore, the barometric column at London with that representing a corresponding pressure at Paris, we must add two corrections—one for the difference of the temperature of the standard, and a second for the decrease of gravity.

The corrections will be as follows :—

Barometer at London observed, and reduced to freezing point	29·905 inches.
Correction for temperature of standard	+·009361
Correction for decrease of gravity	+·006668
	29·921029 equivalent pressure at Paris.

This is very close to the equivalent pressure which Regnault gives in his tables, viz. 760 mm. = 29·922 inches.

I have adopted the increase of gravity as given by Guyot in his tables, as that most likely to be referred to. This gives the ellipticity of the earth as $=\frac{1}{299}$. Plantamour and others differ slightly from this; and if we take the ellipticity of the earth as given by the British Ordnance Survey, $\frac{1}{294}$, we shall get the increase of gravity from the equator to the pole = ·00527919; the difference between that of Paris and London = ·00023642, and the amount of correction = ·007070, a still nearer approximation.

In the correction for temperature, I have made use of the coefficient

for the cubic expansion of mercury given by Laplace and Lavoisier, viz.—

0·000180180 for 1° cent., or 0·0001001 for 1° Fahr.,

this coefficient being adopted by all the tables both English and foreign. Regnault's determination, however, of the expansion of volume of mercury is 0·00018158 for each degree centigrade; but from this he deducts the superficial expansion of the glass tube =0·000017226, giving the correction for the dilatation of the mercurial column =·000174304 for each degree centigrade. This seems the more correct plan, and was adopted by Mr. Stewart in some experiments for determining the melting point of mercury ('Transactions of the Royal Society for 1863,' p. 430), but of course we travellers shall make use of the old tables. CHARLES PACKE.

ALPINE BYWAYS. VI.—*Sertig Pass from Davos to Scanfs.*—It seems to be the popular belief that there are only two direct ways from Davos am Platz to the Engadine, viz. the Fluela and Scaletta passes; and of these the Scaletta is the only one available for those going to the Bernina country. The Scaletta has certainly the merit of being combinable with the Schwarzhorn; but those who have devoted a day to this expedition, and in so doing been over the finest part of that pass, may be interested in hearing that there is a much more beautiful and scarcely longer way leading to the same point.

The way lies down the Davos Thal for some two miles, crossing the stream at the first bridge below Am Platz, and leads into the Sertig Thal opposite Frauenkirch. A char road ascends this valley to the inevitable Dorfli; so far the valley preserves a soft and pastoral character, but here it completely changes, both the branches into which it divides being overhung by rocks of the wildest forms. Up the southern branch or Ducan Thal a pass leads to Bergün, which Theobald speaks of as very savage and grand. Our way lies up the eastern branch or Küh Alp Thal. This is followed to its head, and in about 4½ hours from Davos the grat which forms the summit of the pass is reached. The last part of the climb is over *geröll* and beds of snow, and this is the only part of the expedition which would be difficult for ladies. A glorious view of Piz Kesch with the Vadret da Porchabella hanging from it is gained from the col, and is sufficient of itself to make this the preferable way to the Engadine. A quarter of an hour's steep and sharp descent brings us on to the watershed between the Vals Tuors and Sulsanna; on either side of which are the two small lakes so common on the summit of Grison passes. Down the Val Tuors lies a second way to Bergün; and there is probably a third and very fine one skirting the Vadret da Porchabella and leading into another branch of the same valley, but I have not heard of its ever having been made. Another hour and ten minutes bring us to the Bergamesque hut, where the path from the Scaletta joins the one we have followed; thus far the left side of the valley should be kept. The rest of the way is well known. I will only add one word, that no inn in Scanfs can furnish more than two beds; parties requiring larger accommodation must therefore go on to Zutz, where the Schweizerbund will supply all that is wanted. The Piz Kesch well deserves attention: in August last it had not been

ascended; but a party of Germans were then employed in blasting steps in the last hundred feet, which form the real difficulty.

F. L. LATHAM.

THE FINSTERAARHORN.—The ascent of this mountain is usually made, either by the Grünhorn Lücke, after passing the night at the Faulberg Cave, or by the Viescher glacier, using the hole on the east of the Rothhorn for the night's bivouac. Both resting-places are inconvenient; the Faulberg is so far removed from the base of the mountain as to throw an unnecessary additional distance into the following day's work. There is the further detriment of having to ascend to the Grünhorn Lücke, with a corresponding descent on the further side to the base of the Finsteraarhorn. On the other hand, the Rothhorn Cave, being the one used for the ascent of the Oberaarhorn or the passage of the Oberaar Joch, is out of the direction for the Finsteraarhorn. Impressed with these disadvantages, in an ascent of the Finsteraarhorn, which Messrs. Hopper, Chater, and I, with Christian Michel and Peter Baumann, both of Grindelwald, as guides, made from the Æggischhorn last season, we sought a shelter for the night nearer the base of the peak. We diverged from the Oberaar route, where the Viescher glacier is again struck, after clambering up the well-known waterfall, and crossing the mountain slopes beyond. Traversing the glacier diagonally towards the Finsteraarhorn, we were successful in finding, on the extreme west slope of the Rothhorn, and within 15 minutes of the glacier flowing down from the Finsteraarhorn, a detached rock, resting on a kind of keel, from which its sides sloped upwards at an angle of about 45°. This shape and position allowed us, by building a low surrounding wall, to convert the enclosure into a tolerable gîte. Leaving it the following morning at 4.15, we were enabled, despite a detention of nearly three hours by snow-storms, to effect the ascent, and return, by the Grünhorn Lücke, to the Æggischhorn Hotel at 7.45 that evening. I conceive that this is preferable either to starting from the Rothhorn Cave (east side), or to making the excursion the reverse way from the Faulberg; and a knowledge of the existence and locality of the gîte may be of use to some readers of the Alpine Journal.

FREDK. WM. JACOMB.

SECOND ASCENT OF THE VIESCHERHORN.—On August 3, 1863, Mr. Hopper and I, with Ulrich Kaufmann and Peter Baumann as guides, slept at the Eiger Hole, and on the following morning reached the top of the Mönch Joch at 6.30. When we had descended the Trugberg Glacier for nearly an hour, the ascent of the Viescherhorn looked so tempting that we determined to attempt it. Accordingly at eight we left our knapsacks on the level of the Trugberg Glacier, and struck up a steep and rather crevassed glacier to a point about half way up the north-western arête of the mountain. We gained the arête at 9.30, having a steep ice-wall to surmount after crossing the bergschrund. We reached the summit at eleven, remained half an hour, and returned to our knapsacks at 1.25. If the start be made from Grindelwald, our route would be found the most direct, and Kaufmann, who accompanied Messrs. George and Moore in the first ascent,* gave it as his opinion that our arête presented fewer difficulties than the wall by which they

* See Alpine Journal, No. V. p. 236.

ascended, while the glacier by which we reached the arête was much less broken. No words can do justice to the magnificence of the view.

GEORGE CHATER, JUN.

This, the highest of the Grindelwald Viescherhörner, or Walcherhörner, the sixth of the Oberland peaks in the order of height, has hitherto remained without a distinct name. That of Gross Viescherhorn has been appropriated on the Federal Map to the point most conspicuous from the lower Grindelwald Glacier, which is but the fifth in order of these peaks, being 12,707 ft. above the sea. It being necessary to distinguish the more important summit, the writer suggests, with the concurrence of several of those best entitled to give an opinion on the subject, that the most appropriate name to connect with this hitherto neglected peak, is that of Christian Almer, the first man who reached the summit; and one who has shown in the passages of the Jungfrau Joch, the Sesia Joch, and many other difficult expeditions, that he has no superior among living guides to the high Alps. The *Almerhorn* (13,281′) will probably be readily admitted by that name into the local topography of Grindelwald.

JOHN BALL.

THE TÖDI.—Amongst the many excellent arrangements which the Swiss Alpine Club are making for facilitating exploration, is the erection of a hut on the Grünhorn, nearly 3 hours higher up than the Sand Alp, from whence the ascent of the Tödi is usually effected. At the time of my visit (1863) the building had only progressed so far as its outer walls, and was roofless. There was, however, a piece of tarpaulin; and, as I sat there 16 hours in the rain, I was thankful for even this limited shelter. Let into the walls are receptacles for a standard barometer, cooking apparatus, and other unusual luxuries, which it is the intention of the club to keep there permanently. From the registry-book in one of the cupboards, I appear to have been the first visitor. To reach the hut, it is not necessary for the traveller to ascend to the Sand Alp, which involves a détour and subsequent loss of level; he should turn off at the châlet near the bifurcation of the streams, a little beyond the Unter-Stafel, and, ascending the slopes on the right bank of the stream issuing from the Biferten glacier, cross to the left bank, and mount, by the Biferten Alp and a secondary glacier beyond, to the hut, in less than 3 hours from the bifurcation. I may add that M. König, the doctor at Stachelberg, is a member of the Swiss Club, and will gladly give valuable information regarding the district, but that the local guides, Thüt and Leonhard Vogeli, are not to be relied upon in any attempt to diverge from regulated routes, and have not the qualities which distinguish men of their class in other parts of the Alps.

FREDK. WM. JACOMB.

*** *In the September number of the Alpine Journal will be published a summary of all new ascents and remarkable expeditions made during the summer, to as late a date as may be found possible. For this purpose the Editor requests mountaineers to furnish him, at their earliest convenience, with short memoranda of any such expeditions. He would also be glad to receive notes of any new Alpine Byways, by which are intended expeditions practicable for ladies, or at any rate for moderate walkers, which are not described in the guide-books.*