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I.—*The Val d'Anniviers.*

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MEMBER OF THE ALPINE CLUB.

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I HAVE, when travelling, so often wished for some little indication of the scientific features of the country, beyond the meagre information of the guide book, that it occurs to me to suggest collaboration amongst mineralogists for mutual information.

With a view to this, could we not agree to take some localities and work out their details, spending our holidays in un-hackneyed districts, at quiet inns and in fresh air, each reporting his results succinctly in the *Mineralogical Magazine*, with a sketch map where wanted?

As a little-worked-out place, I for my part nominate the Val d'Anniviers or Einfischthal, leading from the town of Sierre, in the valley of the Rhone, at nearly right angles to it, into the very heart of some of the sublimest scenery of the Swiss Alps, and, as it will be seen, affording great facilities for meteorological, botanical, geological and mineralogical studies, economical quarters, warm-hearted people, and excursions and scrambles of every grade of length and difficulty.

I propose now, in imagination, taking my brethren of the hammer and blowpipe to these happy hunting grounds.

But as la Belle France, which has to be traversed, is, comparatively to the mountains, a dull affair, I will suppose us to have taken return tickets for one month, *vid* Paris to Geneva (the price of which, from Cook the tourist agent, was, this summer, 1st class £8 19s. 0d.; 2nd class £6 13s. 0d.), to have left London early one morning, taken the night train from Paris, and arrived at Geneva about 10.35 a.m., and to have had a comfortable wash and breakfast.

Once at this bright and charming city, with Mont Blanc in the distance, the blue Rhone at our feet (ye chemists and mineralogists solve this problem of blueness!) it is not likely we shall halt on the threshold of the wonder-world, but, leaving the sight-seeing of towns for our return journey, take the afternoon steamer, and, after a voyage, of which the interest increases as we wind eastward, we land at the further end of Lake Lemman, take our seats in the train, and, whisking past mountain and torrent, turning the corner of the Valais near Martigny, sacred alike to the geologist and to Ruskin, we arrive in due course at Sierre, and shall probably, before nine in the evening complete our long journey of two days and a night by eating an excellent supper and turning in "for a long watch below" at the clean, comfortable, and moderate Hotel Bauer.

Next morning we proceed, after a not over early breakfast, to make up our knapsacks, and those amongst us who have such things, fulfil a national custom by *posting* any carpet bag or heavy article at the Post Office, directed to ourselves at Zinal; an arrangement so convenient and so much less expensive than the extra horse it would involve, did we not part company with our impedimenta, that I wish the arrangement were adopted in other countries.

We also, at the Post Office, buy a little book, the tariff for carriages, horses, guides and porters, to which we can refer when we wish to make further excursions.

Hiring a light char for each couple of "'ologists" we set out across the fertile Rhone Valley, through the scrubby forest of Pfyn (the *ad finis* of the Romans) where in 1798 the Valaisans fought a tough fight against the French. We then begin to ascend, by a capitally engineered road, the flanks of limestone mountains. The course we have to make is south, but many a wind of the road opens to us many a varied view of white houses and culture in the valley

and of the outliers of the stern oberland range of peaks and glaciers beyond.

We shall observe the occurrence of carboniferous shales in small quantity, and bad quality. At length reaching the level of the upper valley we turn angle after angle of precipice, passing sundry spots where the lives of road makers have been sacrificed for our present comfort; looking from time to time down the profound ravine sculptured by the wrestling stream of the Navisanche, far below. Even to travellers all but cloyed with the grandeur of the Mont Blanc, Oberland and Monte Rosa ranges, this magnificent drive, perhaps from its very contrast, is most impressive—crede experto. As we approach Vissoye we perceive, on each side of the gorge, junctions of limestone with altered rocks. Of course we may expect to find many of our most interesting prizes at such points. Beyond Vissoye, when I last visited this valley, the char road ended, and a bridle path only existed. Now, very likely, the road is carried on to Zinal. As we advance, the rocks around us become evidently metamorphic, with puzzling alterations of schists and sedimentary strata, which we must make it our duty to unravel so far as we can. Near Ayer, which we soon pass, are the mines of Grand Prat, worked for red nickel and cobalt, and where grey copper ore and copper pyrites occur. Half way hence to Zinal, and on the west side of the valley, is the Corne de Sorrebois, affording a magnificent panorama, easy of access for ladies, greatly helping the knowledge of the geology of this part of the Alps, and having a curious jumble of schists, beds of gypsum, &c.

On both sides, the mountains have become imposing; we feel that we are approaching the great fastnesses of the upper world, whilst the ravine beneath us becomes more and more insignificant and at length ceases. To the east, the Diablons, looking all but inaccessible, and to the west the Garde de Bordon, are the flankers of a mighty group, of which the Weisshorn is perhaps the king.

After some five or six hours from Sierre we reach Zinal, where, at the mountain Hotel Durand we shall find a warm welcome, fair living and moderate prices, always supposing my friend Epiney to be landlord still, and to be still blessed with a wife who makes everybody comfortable, and shews energy enough to manage the Grand Hotel of Paris single handed! The travellers we may meet will not be numerous, but of the right kind, full of information

regarding the mountains, appreciative of scenery, and mostly stalwart about the legs, and *not* anxious to "do" the Alps in three weeks. Still we shall be housed and fare all the better if we have written in advance to Monsieur Epiney.

Before we explore the upper portion of this valley I will mention the principal minerals which I have heard of, or seen, or collected, and I may observe that I have not taken any interest in fine specimens, the existence and mode of occurrence of a substance being to me of an importance overwhelming other considerations. I very much regret to have to confess also that I have carefully and for five years placed my note book concerning the regions in question in such safety, that I am quite unable to lay hands upon it!!!

The list—a most imperfect one—which I give, will show how those who will search this unfrequented district may hope for many trophies of their campaign. Also, the list is chiefly that of minerals occurring in the lower portion of the valley: in the crystalline rocks above Zinal the work has yet to be efficiently done. I have placed a star against such minerals as I have found on the spot, and a dagger against those I have seen and identified, in some instances with analysis.

My list cannot pretend to be at all complete, even so far as already ascertained. The difficulty in getting foreign books in England is disgraceful to our country.

* Earthy Cobalt	* Nickeline (Nicolite)
* Cobaltite	* Copper Pyrites (no good crystals)
† Smaltite	* Red Hæmatite (locality not identified, but from this valley)
Fahlite (Tetrahedrite)	* Quartz (very various)
Bismuth Fahlite	* Epidote
† Annivite (var. of Tetrahedrite)	† Steatite
Rammelsbergite	† Celestine
* Sulphide of Nickel (white & red)	* Gypsum
Vivianite	
Chloanthite	

Amongst rocks I may mention—

* Talcose Slate	* Carbonaceous Shale
Cargneule	Gneiss—red and other
Dolomite	

Above Zinal, we are close upon the great masses of that crystalline mineral—*ice*! At a spot called MOUNTETS, some 3½ or 4 hours' walk from the Inn, is a cabane built by the Swiss Alpine Club for the use of travellers. It is in the middle of a vast amphitheatre

of ice and rock hardly rivalled in the Alps for grandeur and accessibility; the expanse of the Zinal or Durand Glacier lies below, surrounded by many of the most difficult, steepest, and highest of the Swiss Alps, including the Weisshorn, Schallhorn, Rothhorn, Gabelhorn, Dent Blanche, Grand Cornier, Dent des Bouquetins, &c. Here, at an altitude at which continuous meteorological observations are rarely practicable except with such a facility, ought to be established an observatory similar to that on the Col de St. Théodule.

But even now there is a cabin, a pot, and frying pan, to the cleanliness of which I advise my friends to look (once more crede experto), a stove, and some berths similar to those on board a sea going ship. By sending up from Zinal fuel, provisions and wraps, one can, without any hardship and almost without fatigue, spend ones' days in the investigation of the upper ice-world. My mother, then seventy years of age, spent a night there in 1871, and was delighted!

The scene is stupendous, the lights and shadows such as cannot be witnessed at a lower elevation, and the hut forms a good starting point for many excursions and ascents, which, taken from Zinal, would be far more fatiguing.

Here we find the last stages of metamorphism in the form of gneiss. I have been on several points of the high ridge and several peaks south of Mountets, and found these rocks, wherever they appeared through the snow. Those who wish to study the most metamorphosed rocks, Gneiss and Serpentine, should leave this valley by the Glacier pass of Col Durand, starting about 4 a.m. from the cabane at Mountets, and, searching the numerous moraines on the south side of the pass, wend their way to Zermatt, near which they can study Serpentine rocks and the Garnet group.

Having, I fear, much exceeded my space I leave my co-ologists (as many have left their friends before now!), to get back how they can! The problems of this region only will take all the time they will be likely to have it in their power to give. The wonderful series of change in the rocks forms an epitome of the history of metamorphism in itself, which may, of course, be seen elsewhere, but in few places more completely within a moderate walk.

I ought to remind the botanist that the change of rock and soil, and the great range of altitude cause a corresponding variety in the vegetation, and that his vasculum and his store of blotting paper

should be tolerably large. Those who stop for some time could make arrangements by the week on very economical terms, far lower than in any English country Inn that I wot of, let us say from seven to nine francs a day, all, except wine, included.

“Die Minerale der Schweiz,” by Dr. A. Kengott, and Professor Studer’s “Index der Petrographie und Stratigraphie der Schweiz, &c.” will be found useful books.

I hope no man will neglect to take and use a prismatic compass, a clinometer, and an aneroid, and to furnish his successors with plenty of careful cross-bearings and heights.

Suppose some of us try to rendezvous at Zinal, August the first, 1877, for associated work.