The Serra da Estrella and its Records. By Charles Eden.

WHEN Alpine climbers have thrust their stocks through the crest-wave of every peak in Europe, and trampled the edge off every arête; when not only the Alps, but even Iceland and the Caucasus are exhausted; nay, the Himalayas and Andes have not one virgin spot of snow to offer, will glacial pioneering and discovery be no more? For those who live at the juncture of two infinites, fortunately not. Although we shall have done all we can, as at present organised, within the one called space, we shall still have a long tether to run within the other, Time. Those glaciers of the past are by no means all traced out. Much is doing; and, from the time when Agassiz first set the ball rolling among the mountains of Helvetia to when he gave it a last kick on the red hills of Tijuca in Brazil, much has no doubt been done. We have our ancient glaciers of Scandinavia and Russia, of Britain, of North and South America, India, &c.; and lastly, we have our tropical glaciers of South Brazil.

> . . . Quid nos dura refugimus
> Ætas?

Among the mountains which in 1864 had not been explored for traces of these great glaciers defunct, was the Portuguese Serra da Estrella, that lofty waste of white granite, the reservoir of the Mondego and the Zezere, between which streams it lies for a long stretch.

There is something refreshing in the notion of ice, even though it be older than the cave-bear, in a climate like that of Estramadura, and an additional zest was added to my expedition by rumours of an inaccessible peak.

The peak was said to be like a pitcher, and near it were lakes with legendary bottomlessness, while the surrounding wilderness was infested with wolves and haunted by witches. I am all the more willing to shadow forth the marvellous wonders of the expedition at this early stage, that the peak proved perfectly accessible and very unlike a pitcher, and that no more fearful beast than a rabbit ever crossed my path. Only with respect to the witches and the waters is there still room for doubt, and consequently for enquiry. I neglected to seek for a bottom to the lake, and the witches neglected me.

At Coimbra the Mondego ripples over white sands, or foams from under the shadow of sombre cliffs, or glides away majestic under lines of whistling poplars; but our business rather lies

in the recesses where an oozy morass is all the life-spring of the impetuous stream. At Coimbra monument after monument of departed taste or historic interest rise above each other, from the convent of Santa Cruz among the sedges to the battlemented church, of Moorish fame, and the university upon the topmost crag; but the monuments we have to seek are older yet, grander yet, of yet larger import. If one stands in some old archway and glances down upon the town, ghost after ghost of stalwart men of mark—an Affonso Henriquez, a John I., a Pedro—shade upon shade of fair women, such as an Inez de Castro, or a Maria Teller de Menezes, victims of a cruelty such as might wring tears from the very stones, seem to move once more through the shadowy streets where they triumphed and suffered so long ago. But the scene we would rebuild is older than the very race that built Coimbra, a solitude without a breath of life, architecture grander yet.

It is not easy to tear oneself away from the old capital of Portugal, but it must be done would we explore the Serra; for though the mountain is indeed coming to us where we are, as may be seen by a glance at the sands of the Mondego, still its massiveness suffers decidedly in the process, and we have scarcely time to wait so long.

We, for I had a companion, had splashed through the ford, and ridden through the heather for an hour or two before I detected in the pale distance, the grey mass of the Canariz, the highest point of the Estrella, rising 7,000 feet or 8,000 feet above the sea, but as yet many a stout league away.

Limestone hills of rich colour and considerable elevation, on whose aromatic highlands the myrtle often alternated with the heather; where at intervals the great clump pine slept above its own shadow, double blots in the sunny space—stretches of fir wood, tortured and stunted on the heights, majestic and free in the lowlands—dells of rock, fragments, and gnarled chestnut trees beside rippling water—such is the country through which wound our track to the bridge of the Rio Alva, sister stream of the Mondego, into which it falls. The Serra da Estrella is an ancient and important manufacturing centre, and yet 'track' is the best epithet I can give to the rude way which connects it with Coimbra, and along which merchandise, for the most part, passes only on human heads. There is, indeed, a magnificent macadamised high road, along which we rode for some miles, but like a marble breakwater in mid-ocean, it has no connection with the shore at either end—and so it may yet be for long in the sunny, insolvent south.

The country itself is a lovely wilderness—innocent, in the

main, of husbandry as Helvetia on the coming of the monkish Scots. There are, indeed, fazendas, aldeas, villages, but with new-world intervals of waste between. And very peculiar, and peculiarly sad, is the type of these hamlets in the district between Coimbra and Vendas Gallinas. If I call it stercopagan, there will be no fear of the *inhabitants* feeling hurt by the expression, and it best describes their speciality. Roughly built of the dark stone of the neighbourhood, the hovels are huddled together literally on a dung-heap. This latter is composed of heather several feet thick, which lies rotting in the streets, with whatsoever streams into, or is cast out upon it. The windows have no glass; the rooms, beyond a saint or two, little or no furniture; and the inhabitants nothing to eat. And yet in this ordure live people that would not accept a dump for a glass of water—no, not for anything.

Once clear of the limestone hills the road runs pretty straight along the valley, on a terrace of broken gravel or débris, somewhat above the plain to the left or north. First the material of this terrace, and (just where we left it to diverge—to the right to S. Romão) a succession of peculiar elevations in it, which looked to me very like moraine terminations one behind the other, struck me as partial evidences of former glacial action. There was perhaps nothing that might not be accounted for otherwise; but still, as far as they went, the phenomena were those one would expect if the flat ridge or terrace along which we had lately ridden, owed its origin to glacial accumulation.

When we turned off to the right, the rocky course of the Mondego was below us to the south, and beyond rose the rounded outworks of the Estrella, now close by. Before reaching S. Romão, a cloth-making village at the foot of the mountains, I noticed a number of large detached rock fragments perched on the slopes along which we passed. These might very well have been transported to their present position by ice from the heights in front. As I was pressed for time, and my companion was ill—my companion by the bye always is ill—I did not examine them closely. I thought if my ice expectations, now strong, were to meet with full confirmation, I should find plenty of boulders further on in the Serra, while the highest summits of the ridge would, on the other hand, in all probability be bare and smooth.

Oddly formed and tumbled fragments of the hills may often be met with in granite countries in positions which they have occupied without assistance from glacial or other violent agencies. Sometimes, as at Cintra for instance, disintegration at high

elevations has resulted in the precipitous fall of huge masses, which have ceased rolling when and where they might; at others, the blocks can hardly be said to have occupied their present positions, in any active sense, at all; the position has rather been dwindling away, like butter in the sun, from around them, slowly but surely, ever since the rock of which they form a part was first exposed. The most perishable stone has yielded, sometimes in masses, sometimes in veins or débris, and downfall and ruin, whether slow or sudden, has been the sure result. The less corruptible block nucleus or nodule remains for a time perched, as it were, in lonely isolation.

One consideration that must guide us not a little in determining the agency to which we should look to explain such phenomena, is the chemical composition and mineral character of the rock. The Cintra granite, as the gneiss of Rio de Janeiro, is often so soft that you may thrust a stick a considerable distance into it. The felspar contains apparently a large admixture of potash, the potash has a great affinity for the moisture of the atmosphere, hence the facile dissolution.

Now the Estrella granite is the very reverse of this, and with its large crystals of milky felspar, clear quartz, and speckly mica, is a perfect picture of the material of which mountains with any pretensions to permanency should be made. It is not easy to attribute the position of perched and strangely-placed boulders of this substance, especially when existing in any numbers, to disintegration through atmospheric influences in the way above alluded to.

St. Romão is somewhat better off than the villages of the stercopagan district, but poor and miserable in the extreme; the only solace in the place is the geniality and kindness of the inhabitants, and the well-woven blue cloth that falls from the handlooms. All the wool which the Estrella can produce is worked up in the belt of villages at its base, and is not sufficient to supply the entire industry, so that raw material is imported into the district from a distance. Larger factories exist, and water power is here and there made use of; but the bulk of cloth is, as far as I saw, produced by small handlooms in private houses.

A ride through wastes of white granite, bare, or but scantily covered with heather, coarse grass, and patches of rye, intersected by brisk, but at this season far from torrential streams, with here and there a morass, brought us by set of sun to the blue gorge in which lay Manteigas. From its edge we descended through fine chestnut woods—the more striking after the barren northern slopes—to the beautiful little valley and

the dark village huddled together in its shadow. But distance does a good deal more than 'robe the mountains;' and, after splashing through the village brook, the charm of dreamy expectation had to yield to the disappointment of reality.

It would keep us too long from our ice to tell of the hopeless darkness, paralysis, and squalor of that sad place; the sordid, crumbling houses merged in the oozy street, alike in colour and filth; the squalid, haggard inhabitants hanging round them, and the one solitary bullock-cart groaning on among them. It seemed as though at some remote period of the past, a landslip had carried the village into a quagmire, moral and physical, there to remain for ever and a day. And yet a hidalgo of fair name—a Senhor, I know not what—de Portugal, lords it in a château up above, and from the miasma so close beneath his gentle nose, suffered, it would seem, no sort of inconvenience. Two things saved our tired souls alive—the village shop contained in its dingy hollows some popular remedies; a villager had shot a partridge. My sick friend consumed the former, I the latter; and the next morning saw us once more in the saddle, en route for the inaccessible peak.

Our information respecting it had, of course, been contradictory. The peak was impracticable, and a goatherd had been up it after one of his flock. I now know one of these statements to be wrong, and I doubt the other.

The name of the most interesting crag is the Lean Pitcher (Cantaro magro), that of a craggy buttress in its neighbourhood, the Fat Pitcher (Cantaro gordo), and that of the highest part of the ridge, the Canariz. The latter is a huge dome-like mass terminating the Serra to the west, some 7,000 to 8,000 feet high, and capped by one of those hideous stone constructions in which engineers apparently delight.

Having once more attained the higher level of the chain, we rode on in the direction of these culminating points. Rabbits, red-legged partridges, wolf-dogs, sheep, goats, and a few human beings seem to compose the fauna of the Serra. The flora appeared as poor; near the top we found juniper bushes clinging like gnomes to the lee-side of rocks. The stones, on the other hand, fully merited the attention they soon attracted. There were cairns, stonehenges, perched boulders, worn fragments of varied shapes and size. At length we came to a part where the backbone along which we advanced, narrowed considerably, sloping away abruptly on the right to a lake, and on the left dropping into a deep gorge which contained a dark tarn, while on the edge of the chasm overhanging the abyss,

rose the crags known as the Pitchers. Immediately in front was the bald mass of the Canariz, the naked rocks leading to the summit having a rolled out, crushed appearance, one layer occasionally overlapping another, much like a pile of pancakes. All was smooth and bare, and utterly free from the boulders so numerous a little way lower down.

Somewhere hereabouts we came upon thin puddle-ice. At the base of the last rocks we dismounted, and ascended the steep but not abrupt slopes to the summit of the Canariz. From here the descent to the west looks fairly precipitous, and the view (do not be alarmed, I am only going to allude to so much of it as touches upon my subject), though hazy, extended; we thought we saw the Atlantic, and did see the Serra of Penamacor. To the north the broad valley, close on this side of which runs the Mondego, was bounded by the lofty Serra de Viscu; away to the west it was blocked by the high limestone hills, over which we had come from Coimbra, and among which the Mondego joins the Alva, and, thus reinforced, forces a passage to the sea; on this, the south side, lies the huge rampart on whose culminating point we stood—only towards Spain did the country seem somewhat more open.

It was difficult to sit long looking at the scene without summing up the phenomena with which we had met in the last two days—the terrace of débris—the boulders at the base of the mountain—those still more numerous and striking within its recesses—the absence of such fragments on the highest levels, and, in their place, that bald and rolled appearance of the rocks. Still more difficult was it not to see, on such evidence, the pink hills and tawny waste below change to a white arena, in which glacier after glacier streamed from the side-valleys laden with materials for the construction of that elevated back, along which, for some distance, our road had passed the day before, and which I now looked on as a central moraine. In descending to examine one of the lakes, another testimony in several places attracted my attention, in the shape of sharp scratches on the rock.

I humbly submit my belief in the traces of glacial action in the Estrella to better men than I, to disprove or affirm. They will have no cause to regret either the draught of air they will get on the free heights which defied even Cæsar and the Roman eagles, and the dreamy sauntering they may afterwards enjoy through that labyrinth of romance—old Coimbra.

We found the Lean Pitcher very far from an inaccessible peak. It rises in a striking manner from the gorge before described, being only connected to the central mass or sides of the hollow

by a narrow neck, and descending precipitously to the dismal tarn on all its other faces. Its craggy look and steep sides quite galvanised my sick friend, who set to with a will, and, after a short, amusing scramble, we reached the top, where the invalid, in a transport of delight, set to pirouetting on one leg for the edification of the guide, who had, of course, deserted us on the brink of the abyss. When we once more reached him, he said: 'When I beheld the pirouetting (no me ficou uma pinga de sangre no corpo), I had not a drop of blood left in my body.' 'I thought,' he added, 'if one of you came down, what would become . . . . of me.'*

Dauphiné in 1870. By W. A. B. Coolidge.

THE accounts we had read of the magnificent scenery of Dauphiné, together with the knowledge that several of the highest peaks remained unascended, and that the district was rarely visited by tourists, induced us in forming our plans for this summer to include a visit to its mountains. Accordingly, we left Paris at 8.40 P.M. on June 21, and next day about noon reached Culoz, where we met our guides, Christian Almer and his son Ulrich, and Christian Gertsch of Grindelwald, our reason for engaging the latter being the dearth of good porters in Dauphiné. We went on to St. Michel, and that evening walked over the low Col de Valloires to the village of the same name, where we spent the night at a very rough country inn. The meadows glowed with Alpine flowers, usual at that early season, far surpassing any we had ever seen before. Clouds obscured the view from the Col, to our great regret. Next morning, the 23rd, we were only able to get off at 8.10 A.M., rather too late an hour for the Col des Aiguilles d'Arve, which we proposed to cross. Our party consisted of my aunt, myself, the three men, an extra porter, a mule to carry our tent as far as possible, and our dog Tschingel. We left the track of the Col de Galibier where it crosses the stream, and turned to the right towards a narrow defile in the distance. After mounting some way, we gained our first view of two of the Aiguilles d'Arve, which remained before us till we reached the Col. Traversing beautiful pastures, we halted for an hour at the last châlet by a stream, and lunched. The Valloires porter tried to persuade us to cross a Col north of the third Aiguille d'Arve,

* Those who may wish to ascend the Lean Pitcher must remember to go at once to the right after passing the connecting causeway.