

Mountain landscape—the Auvergne

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Southwards from Paris, down the length of France, it is some 200 miles before the first substantial mountains are reached. Then, close beside Clermont Ferrand, the land tilts up sharply to display a volcanic landscape of considerable scenic and geological interest. These startling land forms are of comparatively recent origin, for radioactive-carbon dating carried out on vegetation samples charred by the lava flow establishes unequivocally an age of less than 8000 years. This means that primitive man in France actually witnessed smoking craters, exploding cones and lava flows, where nowadays there is a peaceful and settled countryside.

This was a significant location in the history of geology, for here in the late eighteenth century came the conclusive show-down between the Neptunists, who believed that all rocks had crystallised from water solution, and the Vulcanists, who realised that some of the earth's rocks must have solidified from an originally molten state. In 1751 Jean Guettard of Paris recognised that the entire Auvergne landscape consisted of volcanic cones, craters and lava flows, which had burned and discoloured the earth beneath. His report was not well received because, it is said, of its 'Sodom and Gomorrah' implications. In 1763 another geologist, Nicolas Desmarest, discovered in a wayside quarry a sheet of black columnar basalt overlying cindery lava and burnt soil. He traced the basalt across country to the crater of one of the puyes. In the course of later explorations he identified every gradation between lava flows of columnar basalt and extensive sheets of the same rock, later dissected by running waters. These discoveries led ultimately to the acceptance of the Vulcanist theories.

The exact nature of the volcanic process, and the resulting land form which we see today, depended to a large extent on the viscosity of the original molten materials which welled up through fissures from deep down below the earth's crust. Explosive ejection, accompanied by clouds of gases and vapours, deposited rapidly cooled material which gradually built up into a cone, the vent pipe emerging in a crater at the top. Sometimes a later explosion blew off the side of a cone; sometimes a new cone grew up inside a crater or on the flanks or rim of an earlier cone. More viscous, less explosive flow resulted in the spreading of sheets of lava over the countryside or coated the slopes of an earlier cone. Sometimes the viscosity was so high that there was no ejection whatsoever, the volcanic material welling up into a dome beneath the earth's surface and solidifying as such. High viscosity material rising in the vent of a cone could solidify there and then be exposed a long time afterwards by erosion processes—forming a plug. Similarly a vent in the form of a long crack gave rise to the feature now known as a dyke. The lava flows, known as cheires, on which, says de Martonne, 'the wrinkled surface seems hardly to have cooled', flowed along

¹ With assistance from the Auvergne Section, C.A.F.

valleys already existing in the terrain, blocking the exits from side valleys and producing lakes in them which are still lakes today. The origin of lava masses along the tops of hill ridges is of particular interest, because it brings home the scale of the erosion process. The lava flowed in the first place along the beds of valleys in the original terrain and solidified there. When erosion began on the valley sides, the lava sheet protected the valley floor, while the sides were worn away. In the end the sides of the original valley were removed to below the level of the lava sheet, leaving it upstanding as a hill ridge in the present day landscape.



74 *Puy de Dôme from the air.* This and next photo: French Government Tourist Office

Immediately south of Clermont Ferrand is the Puy de Dôme (1465 m), the highest of some seventy miscellaneous cones, 'pustular excrescences breaking out over the surface of the country', which rise above a uniform plateau of 1000 m average height. It is a tourist mountain with an easily motorable toll road to the top (one of the mountain tasks, incidentally, of the competitors in the Tour de France). There is a television mast, a large café and curio shops—the typical continental belvedere. The views are extensive. Although the savage outlines of the volcanic terrain are now hidden by vegetation, under snow a real lunar

landscape is revealed. Among the peaks close at hand are the Puy de Pariou—its crater partially destroyed, the Puy de Come—a double crater with a cone on the rim, Puy Chopine—a plug exposed by denudation and the Puy de Louchadière with an extra large crater, or caldera. Southwards the Cheire d'Aydat flowing from the Puy de la Vache and the Puy de Lassolas into the Veyre valley created the present Lac d'Aydat. A few kilometres to the east is the Montagne de la Serre, which demonstrates the inversion of relief described above—volcanic rocks once on a valley floor now line a ridge top.

Further south-west lies the second great volcanic mass of the Auvergne, the Puy de Sancy (1886 m), the highest point in central France. This is the much eroded remains of three large volcanoes, once some 2500 m high. With a combined base diameter of 17 miles, this massif was bigger than Vesuvius. Ice and water action have led to the present proportions, a mountain area very reminiscent of British hills; more resistant rocks provide pinnacles, particularly in the Vallée de Chaudefour, and some pinnacled ridges also. There is a cable railway from the north (Mont Dore) nearly to the summit, while numerous ski-lifts attest the winter popularity, for this is indeed the nearest ski country to Paris. There are several satellite peaks. The Lac Pavin to the south-east occupies a crater formed by an explosion on the flanks of one of them—the Puy de Montchal.

Southward again, beyond the basalt plateau of Cezallier, is Cantal, the remains of a single giant volcano, once more than 3000 m high. With a base area of 1000 square miles this would have compared with present day Etna. Erosion by ice and water has produced a star-shaped pattern of valleys around the former summit, each with steep flanks and scarps of basalt. Between the streams the triangular tableland areas, called *planaïses*, slope upwards in conformity with the original lava flow, narrowing at their upper ends towards the summit of the Plomb du Cantal (1858 m). The other major summits are Puy Mary, an ice-rounded dome, and Puy Griou, a volcanic plug.

There are other curiosities of volcanic origin on the Plateau de Velay, which lies to the east of the highest mountains beyond the valley of the Allier. In the centre of the plateau is a shallow basin, the Creux du Puy, traversed by the upper Loire, which enters and leaves through gorges. Erosion has left behind some unusual landforms—a basalt butte surmounted by the castle of Polignac, volcanic plugs, one at Le Puy crowned by a church, as well as cones, craters and a crater lake at l'Issarlès.

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As long ago as 1849 a British traveller, Charles Weld, who passed this way, left an account of his travels. He stayed for some time at the spa of Mont Dore, even then a thriving watering place, and as well as taking the baths and teaching fly-fishing to other visitors, made excursions into the surrounding hills. Above Lac Guery he saw the:

' . . . two colossal pyramids, known by the names of Les Roches Tuillière and Sanadoire. They tower to a height of 300 feet, and have the appearance of huge monsters guarding the valley. The structure is divided into regular prisms; those



75 *Roches Tuilière and Sanadoire*

of Sanadoire radiate in many places from a common centre; the prisms of La Tuilière are vertical and on the north side are easily severed into thin lamellae, which are used for roofing purposes hence the name.'

He climbed the Puy de Sancy, on horseback most of the way, but afoot on the final cone:

'It is the culminating point of that vast volcanic crust, which swells and heaves through an area of fifty-six miles in circumference. Here the throes of nature were of the maddest and most stupendous description. The fundamental granite rocks—the foundations, as it were, of the world—were broken like glass, and gave way before the enormous upheaving force which brought forth mountains. The depths of hell were laid bare. Huge contorted pinnacles of pitchstone porphyry, and breccia containing sulphur, are seen immediately beneath the Puy de Sancy, to the north-west, shooting up from the sides of the Gorge d'Enfer.'

He rode round to explore the Vallée de Chaudefour, finding that:

'... the sides of Puy Ferrand literally bristled with huge rocky obelisks—titanic sphynxes, guarding the awful solitudes from human molestation. Some sprung from dense forests, which clothed the lower half of the mountain; others reared their fantastic forms from the naked rock.'

Nevertheless, he decided to take a closer look by returning on foot up the valley and crossing the pass between the Puy Ferrand and the Puy de Sancy. He climbed through the woods emerging at length on the hill-side:

'The rocky spires, which seen from below assumed the forms of detached obelisks, now appeared like huge leaves, standing out at right-angles from the mountain side. Their height was prodigious; and some impended in a most threatening manner. As I approached the mountain summit, the black precipices of basalt and breccia wore a most formidable appearance. Stern indeed was the wilderness that surrounded me.'

At last he reached his *mauvais pas*, a smooth 20-ft wall traversed by a ledge only 6 inches wide, above 'ridges of inclined strata dipping into a dark abyss':

'I think I must have spent fully ten minutes in devising and considering how I could best place my feet and hands to effect this passage. When my mind was made up how to act, I withdrew my eyes from the precipice beneath and, clinging to the sharp projections of the rock with vice-like tenacity, I wormed my way round the angle and in a few minutes had the inexpressible satisfaction of standing on broad, safe ground. Had the ribbon-like ledge given way, I should never have lived to write this adventure.'

And so to the summit of Puy Ferrand and down at length to Mont Dore, where Weld found himself greeted as 'somewhat of a lion' for his deed.²

Later he went on by diligence to Le Puy and its volcanic curiosities, before continuing his tour towards Grande Chartreuse and the Alps.

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A district of erosion relief in the Monts Dore and the Cantal and of recent volcanic action in the Monts Dôme, the Auvergne offers but little in the way of mountaineering. However, there do exist several groups of training rocks which are used by climbers of the C.A.F. from Clermont-Ferrand and its district.

The most beautiful and highest are situated in the massif of Sancy, volcano of the Tertiary period worn away by ice erosion in the Quaternary. Several rock masses, the remains of flows of andesite and trachyte, have been left behind in the middle of meadows and woods.

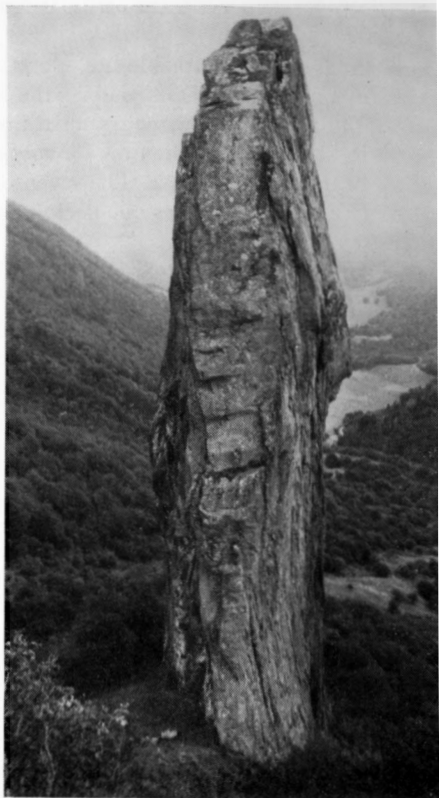
Two of these training rocks are situated in the Vallée de Chaudefour, one of the wildest sites in the region, noted for its plants and animals, to the east of Sancy. At the entrance to the valley, the Rancune, presents East and South faces of 100 m vertical height, while to the west it is linked to the hill-side and is only 60 m high. The rock is a heterogeneous lava. The South face, on which two routes have been made, is quite solid and the placing of pitons is difficult. The routes graded TD+ have sections of V+ and of artificial climbing, with some particularly exposed traverses, impracticable when the rock is wet. In 1971 a route was opened up on the East face. The upper part, absolutely vertical, is fitted with expansion bolts; this route, which has only been done twice, is graded ED with a traverse of VI. The ordinary route, the first by which the

²First British ascent of the route.



76 *Pinnacle in the Vallée de Chaudefour*
(reproduced from C. R. Weld's book)

77 *Climbers on a pinnacle in the Vallée de Chaudefour*. Photo: Auvergne Section, C.A.F.



summit was reached, is on the West face. It is well supplied with comfortable stances and graded D. The descent is made by two abseils of 30 m each on the West face. It seems unlikely that the North face, where the rock is of very poor quality, will ever be climbed. There are several variations of differing degrees of difficulty.

At the bottom of the valley, an hour's walk away, is a second pinnacle, the Moine. Two routes, very seldom repeated, have been made here; one, a free climb, starts on the South face and crosses to the North face by a traverse on the West face. The other, an artificial climb, is on the West face. They are some 50 m long and are graded D and A1.

Further to the west, dominating the valley which descends towards Mont Dore from the north of Sancy, is a pinnacle perched on the north side of Capucin which has also been climbed. The 20-m route is of sustained difficulty and runs for 4 m on the South face followed by a traverse of V on the West face; the abseil for descent is very awkward to arrange because of the small area of the summit.

At another remarkable site, close to the Lac de Guery, two rocky spurs face one another across a valley—the Roches Tuilière and Sanadoire. The Roche Tuilière gets its name from the texture of the phonolite rock, which outcrops in flakes used at one time for roof covering. A very varied training ground has been developed here. The seven routes range from AD (Diagonale) to TD + (Touriste). There is one useful route also on the Roche Sanadoire.

In areas which were not covered by volcanic lava flows, the granite plinth is sometimes exposed. Very close to Clermont-Ferrand, the training crags of Ceyrat and Boisséjour enable practice to be had when there are only a few hours to spare; thin climbs on smooth slabs of fine grain granite at Ceyrat, more enclosed types of climbs on a rock which is much rougher at Boisséjour. The same type of rock and of climbing can also be found a little further afield at the training crags of Champeix and Enval (12½ miles from Clermont-Ferrand).

These unpretentious rocks are very different from those of high mountains. However, they enable climbers of the Auvergne to train themselves ready to tackle the summits of the Alps.