

It then enters a narrow valley, which leads to St. Germain le Joux, having on the right the small river of Charris, which conducts to another lake, named Silan.

The beautiful situation of this lake serves to make it most enchantingly romantic; placed, as it were, in the midst of stupendous mountains, in great part covered with furze, brambles, and verdure. One rural and delightful little village adorns its banks; while a number of corn and oil mills, besides tanneries and cloth manufactories, are seen at no great distance, which both enliven this apparently solitary spot (its direct situation being literally a *cul-de-sac*), giving it a strong resemblance to the enchanting lakes of Switzerland, and likewise greatly conduce to the prosperity and happiness of the people. Desirous of conveying a faint idea of this charming spot, I have, in N° VII. given a view of the lake and village of Charris.

From the village of St. Germain le Joux, which takes its name from its proximity to the mountains of Jura, or Joux, I directed my course towards Châtillon. Following a track, for a dozen miles at least, nearly in a continued ascent, sometimes along the windings of a solitary valley, at other times across the elevated summit of a hill or the abrupt sides of a mountain, I at last arrived at that isolated village, where I shall not attempt to detain my reader, but immediately proceed to where the Rhône loses itself—generally called *La Perte du Rhône*.

As soon as I had passed Châtillon, I descended a steep and rugged declivity for about an hour and a half, which brought me to Belle-garde, a hamlet situate in a small plain, forming a central point of union to a number of valleys which terminate in that spot; then approaching the abrupt banks of the Valserène, a torrent that passes through the valley of Chesery, I soon gained a sight of the Rhône, which I had quitted at Lyons, and crossed the Valserène on a high stone bridge there thrown over this torrent, which is indeed terrific; for its thick muddy waters, rapidly sweeping enormous fragments as they roll along, have dug, through the calcareous strata of the lateral mountains, a bed of such an astonishing depth, that to look from the centre of the bridge almost makes the spectator dizzy.

This depth may be accounted for from the incessant friction of the variety of matter, hurried by the rapidity of the current, over strata which have not acquired any great degree of solidity.

Taking then an easterly direction, I immediately entered another contracted valley, formed by the mountains of Credo, which defend it on the north, and by the rami-

fications of the Vouaches on the south. The bed and current of the Rhône occupying the bottom of this valley, the road rapidly ascends the sides of the steep rocks of the Credo, or rather of the hills which serve as the first steps towards them.

The summits of these hills appear to be wholly formed of heterogeneous matter, in which are found imbedded different species of marine fossils; whereas their bases are composed of hard calcareous stone, of a thick stratum, and finer-grained than the upper, without any trace whatever of fossils. I therefore conceive, from having, since that time, had an opportunity of revisiting the same spot, in order to investigate the matter more fully, that those hills must have been, in great part, formed of fragments detached from the lateral mountains; for, besides displaying here and there wide strata of argillaceous earth, *pierres roulées*, or pebbles, and a fine-grained species of sand-stone, placed in some evident and determinate order, in other places these same bodies are found promiscuously mixed together, in a perfect state of confusion, without order and coherence.

The famous *Perte du Rhône* effecting itself at the bases of those hills, the road, or path, which leads to it, is oftentimes so slippery as to render it difficult of access. Here, likewise, among the rubbish and fragments torn from the lateral rocks, are the children of Coussy (a hamlet seated on the summit of the same hills) employed in searching for sulphureous *pyrites*, or fire-stones, and *cornua Ammonis*; besides a variety of petrified shells, which they collect with care, and offer to travelers of every description, in hopes of gaining a scanty pittance.

Let it however be remarked, that I do not suppose the whole of those fossils to belong entirely to the lateral mountains which border the Rhône; on the contrary, I firmly believe them to have been mostly hurried thither by that great *débâcle*, or convulsion in Nature, which has most probably given the extensive and beautiful lake of Geneva its present form and depth;—at least, this is my opinion; how far I may be right, is not for me to determine.

From the bridge of Belle-garde I soon reached the post-house at Vanchi, where travelers who frequent that road commonly change horses. No sooner had I entered the inn than I was surrounded by boys from eight to twelve years of age, who assailed me on all sides, offering their services, and tendering their merchandise for sale, which consisted of stones, pyrites, shells, fragments, fossils, &c. This party, being presently joined by others not quite so youthful, who assisted in renewing the same importunities,

I had no other means of extricating myself to the satisfaction of this civil, but voracious group, than by purchasing a trifle from each; which having done, I dismissed them, highly satisfied with my extreme generosity (as they were pleased to term it). This, elsewhere, would scarcely have been accepted, or even noticed; but in a spot where life partakes of so much simplicity, and the estimation of objects is only in proportion to their utility, the barter of life are very different from what they are in countries where pride, pleasure, and their concomitant legion of vices, create artificial wants and exorbitant desires, which riches cannot gratify, and under which poverty is doubly miserable.

I have still in my possession a couple of the *cornua Ammonis* purchased at that time; one of them of three inches diameter, but so full of copper as to resemble pure metal; the other of about five inches, very like stone.

I then selected for my conductor, out of this jovial party, one who, with an arch and pleasant physiognomy, had facetiously introduced himself as a guide to *Messieurs les Anglais*, and who really, the short time we were together, afforded me considerable amusement, not only from his extreme vivacity, but from his quickness at repartee, and knack at *bons-mots*. He first began by expatiating, in a long harangue, on the beauties of the scene, and particularly on the astonishing phenomenon I was going to contemplate, meaning *the loss of the Rhône*; adding, that if I had the least desire of leaping across that noble river, I might do it at a single jump. This is doubtless possible, from the extreme contraction of the Rhône at a short distance from where it loses itself, which does not exceed three feet; whereas the same rapid and extensive river, in the vicinity of Geneva, according to Monsieur de Saussure, is nearly two hundred and thirteen feet in breadth. But, after seeing the great inclination of the lateral rocks, which are at all times slippery, and the frightful appearance of the abyss into which the river precipitates itself, surely nothing but absolute necessity could have induced me to attempt the experiment myself, or even have allowed my guide to exhibit his agility on the occasion. My young guide remained perfectly satisfied with my placid determination, and returned with me to Vanchi, where after taking some refreshment, I proceeded to the hamlet of Coussy, and began descending the declivity of the same argillaceous and calcareous hills before mentioned, which I found extremely difficult, and rather hazardous, from the quantity of rain which had fallen the preceding day, and rendered the soil slippery and unpleasant. With care, however, I soon reached an extensive

calcareous bank, which impends considerably over the upper or great channel of the Rhône. I use the word *upper*, or *great*, from its being the one into which the superflux of the water empties itself, when its too great abundance prevents its being entirely swallowed up in the abyss, where it vanishes for a time (no uncommon circumstance at the melting of the snows), and in order that I may distinguish it from the other, which is at least two and forty feet lower than the upper, but in which the river runs previous to its arriving where it disappears.

On this terrific bank, three and thirty feet above the bottom of the upper channel, I remained till I had made my observations on the various directions and thickness of the strata that compose the calcareous mountains, which rise with an abrupt ascent on both sides of the channel, carefully examining their structure, and the species of fossils which they contain.

Having so far satisfied my curiosity, I descended from the bank by means of a ladder, erected, at the expense of the inhabitants of the hamlet I had just quitted, for the accommodation of those who are desirous of taking a nearer view of the loss of the Rhône, and for which they receive a trifling gratuity.

This ladder is placed contiguous to the bridge of Lucey, which is thrown across the upper channel, to serve for a communication between France and Savoy,—those territories being there separated only by the course of that river. From the banks of the channel I forded to the opposite side without much inconvenience from the water, the Rhône being at that time nearly swallowed up in the opening of the rock, which I hereafter purpose describing; but my greatest difficulty, and indeed one which considerably impeded my progress, arose from the huge pieces of calcareous stone which entirely cover the bottom of the channel, and which appear to be detached fragments from the lateral rocks and mountains, as they not only contain similar fossils, but have the same grain and colour. This last, being a dark grey, I attribute to particles of manganese mixed with the calcareous substances of which those mountains are formed; and I likewise remarked large masses of lenticular stone, promiscuously placed among them, foreign to the spot where they now stand, but which are of curious structure, from the extreme smallness of the shells which compose them. These obstacles did not, however, prevent my observing clearly that the concealment or disappearance of the Rhône is in part effected by the salient or prominent lower strata of the two lateral mountains, and the immense heaps of rock above mentioned, which, by

filling the *vacuum* existing between those prominent strata, form a kind of vault, or irregular cavity, into which the Rhône sinks, and loses itself; and this vault, or irregular cavity, which is reckoned to be three hundred and fifty feet in length, constitutes the *Perte du Rhône*. There the river disappears, and is only heard rumbling in the interior of the mountain, near to where it again re-appears. But, in order to be better understood by those who have never visited that curious spot, I shall here add some remarks on the course of this noble and extensive river, previous to its losing itself.

Travelers, who have been induced to go from Geneva to Coussy, on purpose to view this surprising effect, must have observed how greatly the bed of the Rhône contracts as it runs between the range of hills which serve as a kind of basis to the mountains of Jura and Vouaches; since, contiguous to Cluse, or Ecluse, a fort situated on the Swiss frontiers, at the entrance of the defile formed by those mountains, the course of that river has scarcely one third of the width which it has in the vicinity of Geneva. It is, however, certain, that the confined state of the current has dug a bed of extreme depth, although through a number of calcareous and argillaceous strata. Many of these strata, differing from each other in hardness, have consequently been worn through sooner than others, and caused the water to form several natural cascades, or falls, which announce from afar the impetuous current of the Rhône.

This diminution takes place so rapidly, that, at the bridge of Grezin, six miles from the fort of Cluse, the same river is only a sixteenth part of its width near Geneva; and this contraction continues for the space of three miles; so that, near to where it disappears, a tall man might perhaps stride across the current, as already noticed, and thus view passing between his legs one of the finest rivers in Europe, which, at no greater distance than twelve miles each way, exhibits, from the impetuosity of its current, and the width of its channel, a most noble and majestic appearance.

Desirous of giving information, yet wishing to avoid prolixity, I shall confine myself to the following remarks, made with care and attention.—First, that the water of the Rhône flows, for some time previous to its loss, with great rapidity, in a deep but narrow channel, dug by its impetuosity through calcareous strata, which, by its friction, are nearly cut into right angles. Secondly, that these strata vary in their species, and that those which are uppermost are in general thinner and softer than the lower. Thirdly, that the bottom of the channel appears to be partly cut through a greyish argillaceous matter, and partly through the soft kind of calcareous stone, but scarcely

ever through the hard. Fourthly, that, at nearly four hundred paces from the *loss of the Rhône*, the water runs tolerably tranquil over a hard calcareous stratum, which it has not worn through, but that, in consequence of the discontinuance of that stratum, the river, with tremendous noise, has there formed a kind of subterraneous cataract. And fifthly, that the channel in which the Rhône afterward runs through, which is still five and thirty feet lower, having probably a very trifling declivity, the current naturally retains after the fall nearly the same placid state, although much confined between its irregular and chamfreted sides, until, again meeting with other calcareous strata which have remained perfect, that is, without being worn through, the river has been forced to make its way under them, thereby disappearing for the space of three hundred and fifty feet, which is the length of the vault or irregular cavity in which it loses itself.

The first time I visited this remarkable spot, which is as curious as it is romantic, I expected that a river, which, previous to its disappearance, is in itself so considerable, and in many places rapid and impetuous, would re-appear with some degree of velocity; but, on the contrary, I could scarcely discern the direction of its course; for, except some trifling bubbles and eddies (occasioned no doubt by the confined particles of air which disengage themselves from the water, and the resistance it experiences among the craggy rocks in the interior of the mountain), it ascends, from its subterraneous channel, with a most surprising placidness, unaccountable, unless upon the following principle:—It may, I presume, be attributed to the form of the channel, which is most probably that of a siphon, with the leg or end, where the Rhône re-appears, more vertical than the other;—a conjecture which seems the more probable, as it in a great measure accounts for the total loss of a variety of objects, such as dogs, pigs, large pieces of timber, &c. which have at different times been thrown in, by way of experiment. But, what is more singular, this stagnant and almost motionless current re-assumes, at a short distance from where it emerges from the subterraneous passage, the whole of its original rapidity, and, by again becoming considerable, continues navigable until it reaches the Mediterranean sea\*. But, with a hope of throwing more light on the subject, I have annexed two views, which represent the loss and re-appearance of this noble river. (See N<sup>o</sup> VIII. and IX.)

\* Perhaps the circumstances here mentioned, respecting the loss and re-appearance of the Rhône, may induce some to believe, that, in one part of its subterraneous passage, it must filtrate through some very porous stratum, or pass through the interstices of immense beds of broken rocks.