[Mountains.]

THE

WONDERS OF THE WORLD:

AND OF THE

THREE KINGDOMS OF NATURE.

THE MOUNTAINS OF THE ANDES,

IN SOUTH AMERICA.

"*Mountains and all hills—praise the name of the Lord; for his name alone is excellent; his glory is above the earth and heaven.*"

Among the wonders, or uncommon phenomena of the world, may be classed stupendous Mountains; and of these the Andes, in South America, are the loftiest, the most extensive, and, therefore, the most wonderful. Descriptions of objects which are striking, because they are vast, often fail in exciting appropriate ideas; and however accurate or poetical may be the accounts of this class of Nature's Prodigies, no just notions of their vastness can be conveyed by any written or graphical representation. The magnitude of an object must be seen to be duly conceived, and mountain-wonders will be best felt by those who have visited Wales, Scotland, Switzerland, or the mountainous regions of America or Asia.

The stupendous mountains called by the Spaniards the Cordilleras, (from cord, or chain, pronounced by them *Cor-dil-lé-ras,*) or Chains of the Andes, (An'-des,) stretch north and south, near the western coast, from the Isthmus of Darien, through the whole of the continent of South America, to the Straits of Magellan. In the north there are three chains or separate ridges, but in advancing from Popayan towards the south, the three chains unite into

a single group, which is continued far beyond the equator. In the kingdom of Quito,* the more elevated summits of this group are ranged in two rows, which form a double crest to the Cordillera. The extent of the Andes Mountains is not less than four thousand three hundred miles.

> **Rocks rich in gems, and mountains big with mines,**
> **That on the high equator ridgy rise,**
> **Whence many a bursting stream auriferous plays.**
> THOMSON.

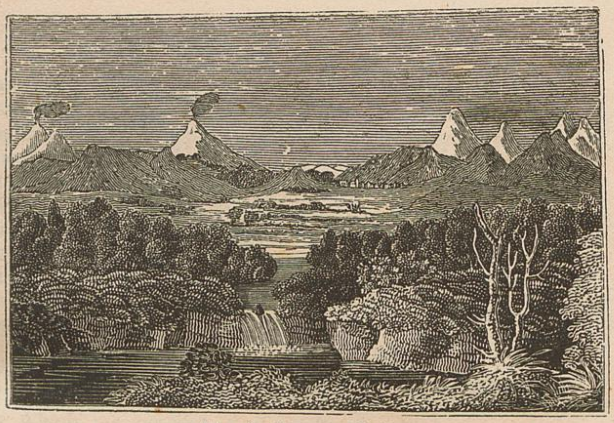
In this country the operations of nature appear to have been carried on on a larger scale, and with a bolder hand, than elsewhere; and in consequence the whole is distinguished by a peculiar magnificence. Even the plain of Quito, which may be considered as the base of the Andes, is more elevated above the sea than the summits of many European mountains. In different places the Andes rise more than one-third above the famous Peak of Teneriffe, the highest land in the ancient hemisphere. Their cloud-enveloped summits, though exposed to the rays of the sun in the torrid zone, are covered with eternal snows, and below them the storm is seen to burst, and the exploring traveller hears the thunder roll, and sees the lightnings dart beneath his feet.

Throughout the whole of the range of these extensive mountains, as far as they have been explored, there is a certain boundary, above which the snow never melts, which boundary, in the torrid zone, has been ascertained to be 14,600 feet, or nearly three miles, above the level of the South Sea.

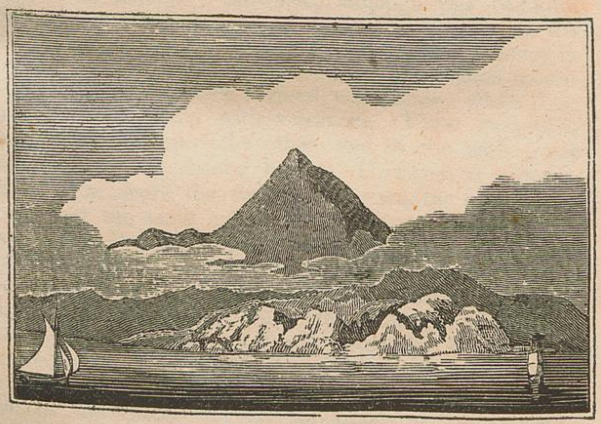
The ascent to the plain of Quito, on which stand Chimborazo, Cotopaxi, Pichincha, &c. is thus described by Don Juan de Ulloa:

"The ruggedness of the road from Taraguaga, leading up the mountain, is not easily described. The declivity is so great, in some parts, that the mules can scarcely keep their footing; and, in others, the acclivity is equally difficult. The trouble of sending people before to mend the road, the pain arising from the many falls and bruises,

* Pronounced Qué-to, the *i* in all European languages being sounded as an *e*.



The Andes near Quito.



Peak of Teneriffe.

and the being constantly wet to the skin, might be supported; but these inconveniences are augmented by the sight of such frightful precipices, and deep abysses, as excite constant terror. The road, in some places, is so steep, and yet so narrow, that the mules are obliged to slide down, without making any use whatever of their feet. On one side of the rider, in this situation, rises an eminence of many hundred yards; and, on the other, is an abyss of equal depth; so that, if he should give the least check to his mule, and destroy the equilibrium, both must inevitably perish.

"Having travelled nine days in this manner, slowly winding along the sides of the mountains, we began to find the whole country covered with a hoar-frost; and a hut, in which we reposed, had ice in it. At length, after a perilous journey of fifteen days, we arrived upon a plain, at the extremity of which stands the city of Quito, the capital of one of the most charming regions in the world. Here, in the centre of the torrid zone, the heat is not only very tolerable, but, in some places, the cold is even painful. Here the inhabitants enjoy the temperature and advantages of perpetual spring; the fields being constantly covered with verdure, and enamelled with flowers of the most lively colours. However, although this beautiful region is more elevated than any other country in the world, and it employs so many days of painful journey in the ascent, it is itself overlooked by tremendous mountains; their sides being covered with snow, while their summits are flaming with volcanoes. These mountains seem piled one upon the other, and to rise with great boldness to an astonishing height. However, at a determined point above the surface of the sea, the congelation is found at the same height in all the mountains. Those parts which are not subject to a continual frost, have here and there growing upon them a species of rush, resembling the broom, but much softer and more flexible. Towards the extremity of the part where the rush grows, and the cold begins to increase, is found a vegetable with a round bulbous head. Higher still, the earth is bare of vegetation, and seems covered with eternal snow. The most remarkable of the Andes are the mountains of Chimborazo, Cotopaxi, and Pichincha."

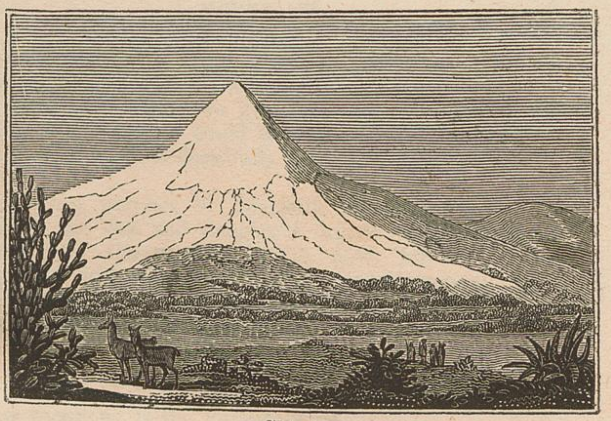
CHIMBORAZO,

THE MOST LOFTY OF THE ANDES.

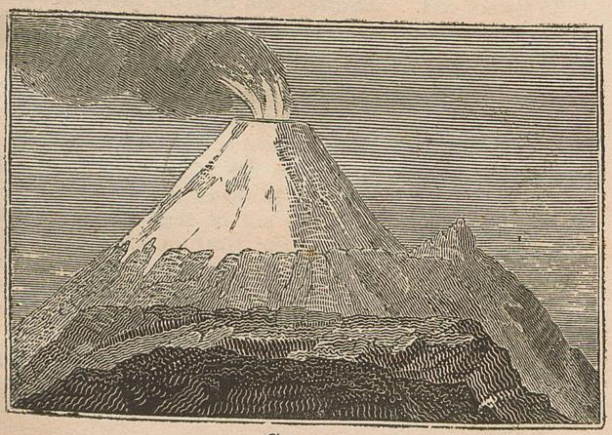
THIS is the most majestic of the Andes, and has a circular summit, 22,000 feet, or above four miles high. On the shores of the South Sea, after the long rains of winter, when the mistiness of the air has suddenly diminished, Chimborazo appears like a cloud in the horizon. It detaches itself from the neighbouring summits, and raises its lofty head over the whole chain of the Andes. Travellers who have approached the summits of Mont Blanc and Mont Rose, are alone capable of feeling the effect of such vast, majestic, and solemn scenery.

The bulk of Chimborazo is so enormous, that the part which the eye embraces at once, near the limit of the snows, is 22,968 feet, or four miles and a third in breadth. The extreme rarity of the strata of air, across which the summits of the Andes are seen, contributes greatly to the splendour of the snow, and the magical effect of its reflection. Under the tropics, at a height of 16,400 feet, upwards of three miles, the azure vault of the heavens appears of an indigo tint; while, in so pure and transparent an atmosphere, the outlines of the mountains detach themselves from the sky, and produce an effect at once sublime, awful, and profoundly impressive.

With the exception of the newly-discovered Asiatic mountains, Chimborazo is the highest known mountain in the world. Hnmboldt, Bonpland, and Montufar, were persevering enough to approach within 1600 feet of the summit of this mighty king of mountains. Being aided in their ascent by a train of volcanic rocks, destitute of snow, they thus attained the amazing height of nearly four miles above the level of the sea; and the former of these naturalists is persuaded that they might have reached the highest summit, had it not been for the intervention of a great crevice, or gap, which they were unable to cross. They were, therefore, obliged to descend, after experiencing great inconveniences, and many unpleasant sensations. For three or four days, even after their return into the plain, they were not free from sickness, and an uncomfortable feeling, owing, as they suppose, to the vast proportion of



Chimborazo.



Cotopaxi.

oxygen in the atmosphere above. Long before they reached the above surprising height, they had been abandoned by their guides, the Indians, who had taken alarm, and were fearful of their lives. So great was the fall of snow on their return, that they could scarcely recognize each other, and they all suffered dreadfully from the intenseness of the cold.

A great number of Spaniards formerly perished in crossing the vast and dangerous deserts which lie on the declivity of Chimborazo; being now, however, better acquainted with them, such misfortunes seldom occur, especially as very few take this route, unless there be a prospect of calm and serene weather.

COTOPAXI.

THIS mountain is the loftiest of those volcanoes of the Andes which, at recent epochs, have undergone eruptions. Notwithstanding it lies near the Equator, its summits are covered with perpetual snows. The absolute height of Cotopaxi is 18,876 feet, or three miles and a half, consequently it is 2,622 feet, or half a mile, higher than Vesuvius would be, were that mountain placed on the top of the Peak of Teneriffe! Cotopaxi is the most mischievous of the volcanoes in the kingdom of Quito, and its explosions are the most frequent and disastrous. The masses of scoriæ, and the pieces of rock, thrown out of this volcano, cover a surface of several square leagues, and would form, were they heaped together, a prodigious mountain. In 1738, the flames of Cotopaxi rose 3000 feet, or upwards of half a mile, above the brink of the crater. In 1744, the roarings of this volcano were heard at the distance of six hundred miles. On the 4th of April, 1768, the quantity of ashes ejected at the mouth of Cotopaxi was so great, that it was dark till three in the afternoon. The explosion which took place in 1803, was preceded by the sudden melting of the snows that covered the mountain. For twenty years before no smoke or vapour, that could be perceived, had issued from the crater; but in a single night the subterraneous fires became so active, that at sun-rise the external walls of the cone, heated to a very considerable temperature, appeared naked, and of the dark colour

which is peculiar to vitrified scoriæ. "At the port of Guayaquil," observes Humboldt, "fifty-two leagues distant in a straight line from the crater, we heard, day and night, the noise of this volcano, like continued discharges of a battery; and we distinguished these tremendous sounds even on the Pacific Ocean."

The form of Cotopaxi is the most beautiful and regular of the colossal summits of the high Andes. It is a perfect cone, which, covered with a perpetual layer of snow, shines with dazzling splendour at the setting of the sun, and detaches itself in the most picturesque manner from the azure vault above. This covering of snow conceals from the eye of the observer even the smallest inequalities of the soil; no point of rock, no stony mass, penetrating this coat of ice, or breaking the regularity of the figure of the cone.

PICHINCHA.

THOUGH celebrated for its great height, Pichincha is 3,849 feet, or three-fourths of a mile, lower than the perpendicular elevation of Cotopaxi. It was formerly a volcano; but the mouth or crater on one of its sides is now covered with sand or calcined matter, so that at present neither smoke nor ashes issue from it.

When it was ascended by Don George Juan and Don Antonio de Ulloa, for the purpose of their astronomical observations, they found the cold on the top of this mountain extremely intense, the wind very violent, and the fog, or, in other words, the cloud, so thick, that objects at the distance of six or eight paces were scarcely discernible. On the air becoming clear, by the clouds descending nearer the earth, in such manner as to surround the mountain on all sides to a vast distance, these clouds afforded a lively representation of the sea, in which the top of the mountain seemed to stand, like an island in the centre.

> With aspect mild, and elevated eye,
> Behold him seated on a mount serene,
> Above the fogs of sense, and passion's storm;
> All the black cares and tumults of this life,
> Like harmless thunders, breaking at his feet,
> Excite his pity, not impair his peace. YOUNG

When the clouds descended, the astronomers heard the dreadful noise of tempests, which discharged themselves from them on the adjacent country. They saw the lightning issue from the clouds, and heard the thunder roll far beneath them. While the lower parts were thus involved in tempests of thunder and rain, they enjoyed a delightful serenity, the wind abated, the sky cleared, and the enlivening rays of the sun moderated the severity of the cold. But when the clouds rose, their density rendered respiration difficult: snow and hail fell continually, and the winds returned with such violence, that it was impossible to overcome the fear of being blown down the precipices, or of being buried by the accumulations of ice and snow, or by the enormous fragments of rocks which rolled around them. Every crevice in their hut was stopped, and, though the hut was small, was crowded with inhabitants, and several lamps were constantly burning, the cold was so great, that each individual was obliged to have a chafing-dish of coals, and several men were employed every morning in removing the snows which had fallen during the night. Their feet were swollen, and they became so tender and sensible, that walking was attended with extreme pain; their hands also were covered with chilblains, and their lips were so swollen and chapped, that every motion in speaking brought blood.

MOUNT ETNA,

IN THE ISLAND OF SICILY.

Now under sulphurous Cuma's sea-bound coast,
And vast Sicilia, lies the shaggy breast
Of snowy Ætna, nurse of endless frost,
The pillared prop of heaven, for ever pressed:
Forth from whose sulph'rous caverns issuing rise
Pure liquid fountains of tempestuous fire.
Which veil in ruddy mists the noon-day skies,
While wrapt in smoke the eddying flames aspire,
Or gleaming thro' the night with hideous roar,
Far o'er the redd'ning main huge rocky fragments pour

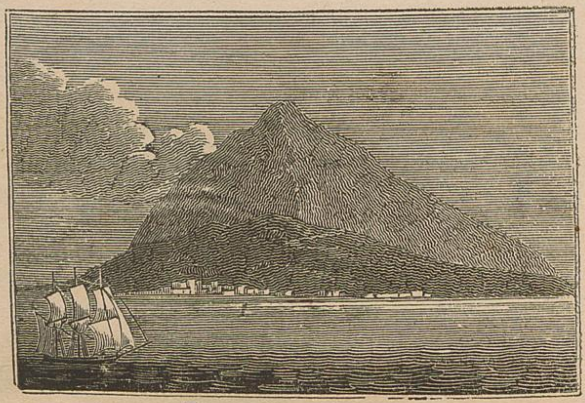
But he, Vulcanian monster, to the clouds
The fiercest, hottest inundations throws,
While, with the burden of incumbent woods,
And Ætna's gloomy cliffs o'erwhelmed he glows.

There on his flinty bed outstretched he lies,
Whose pointed rock his tossing carcase wounds:
There with dismay he strikes beholding eyes,
Or frights the distant ear with horrid sounds.
WEST.

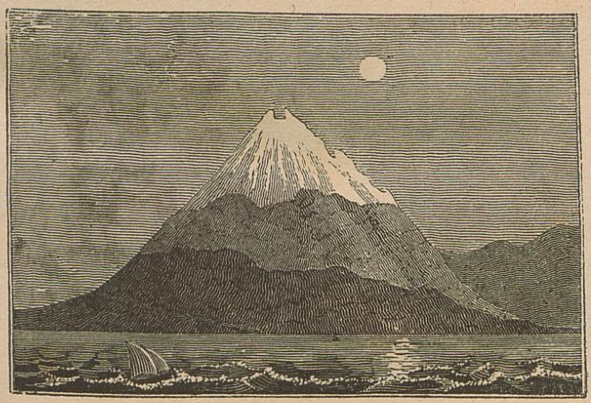
THE majestic Etna, which the ancients considered, not unreasonably, as one of the highest mountains in the world, and on the summit of which they believed that Deucalion and Pyrrha sought refuge, to save themselves from the universal deluge, is situated on the plain of Catania, in Sicily.

Its elevation above the level of the sea has been estimated at 10,963 feet, upwards of two miles. On clear days it is distinctly seen from Valetta, the capital of Malta, a distance of 150 miles. It is incomparably the largest burning mountain in Europe. From its sides other mountains arise, which, in different ages, have been ejected in single masses from its enormous crater. The most extensive lavas of Vesuvius do not exceed seven miles in length, while those of Etna extend to fifteen, twenty, and some even to thirty miles. The crater of Etna is seldom less than a mile in circuit, and sometimes is two or three miles; but the circumference of the Vesuvian crater is never more than half a mile, even when widely distended, in its most destructive conflagrations. Lastly, the earthquakes occasioned by these adjacent volcanoes, their eruptions, their showers of ignited stones, and the destruction and desolation which they create, are severally proportionate to their respective dimensions.

A journey up Etna is considered as an enterprise of importance, as well from the difficulty of the route, as from the distance, it being thirty miles from Catania to the summit of the mountain. Its gigantic bulk, its sublime elevation, and the extensive, varied, and grand prospects which are presented from its summit, have, however, induced the curious in every age to ascend and examine it; and not a few have transmitted, through the press, the observations which they have made during their arduous journey. From its vast base it rises like a pyramid to the perpendicular height of two miles, by an acclivity nearly equal on all sides, forming with the horizon an angle of about fifteen degrees, which becomes greater on approaching



Distant View of Etna.



Etna by Moonlight.

the crater; but the inclination of the steepest part of the cone no where exceeds an angle of forty-five degrees. This prodigious volcano may be likened to a forge, which, in proportion to the violence of the fire, to the nature of the fossil matters on which it acts, and of the gases which urge and set it in motion, produces, destroys, and reproduces, a variety of forms.

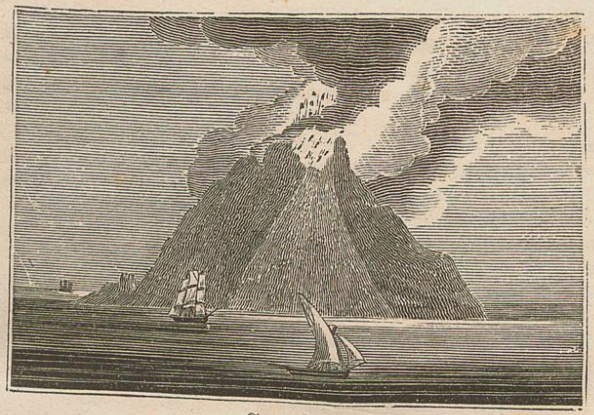
The top of Etna being above the common region of vapours, the heavens, at this elevation, appear with an unusual splendour. Brydone and his company observed, as they ascended in the night, that the number of the stars seemed to be infinitely increased, and the light of each was brighter than usual. The whiteness of the milky way was like a pure flame which spread across the heavens; and, with the naked eye, they could observe clusters of stars which were invisible from below. They likewise noticed several of those meteors called falling stars, which appeared as much elevated here as when viewed from the plain beneath.

This single mountain contains an epitome of the different climates throughout the world, presenting at once all the seasons of the year, and all the varieties of produce. It is accordingly divided into three distinct zones or regions, which may be distinguished as the torrid, temperate, and frigid, but which are known by the names of the cultivated region, the woody or temperate region, and the frigid or desert region. The former of these extends through twelve miles of the ascent towards the summit, and is almost incredibly abundant in pastures and fruit-trees of every discription. It is covered with towns, villages, and monasteries; and the number of inhabitants distributed over its surface is estimated at 120,000. In ascending to the woody or temperate region, the scene changes; it is a new climate, a new creation. Below, the heat is suffocating; but here, the air is mild and fresh. The turf is covered with aromatic plants; and the gulfs, which formerly ejected torrents of fire, are changed into woody vallies. Than this nothing can be more picturesque, the inequality of the soil displaying every moment some variety of scene: here, the ash and flowering thorns form domes of verdure; and there, the chesnut-trees grow to a most enormous size. The one called *castagno de cento cavalli*, according to Brydone and Glover, has a circum-

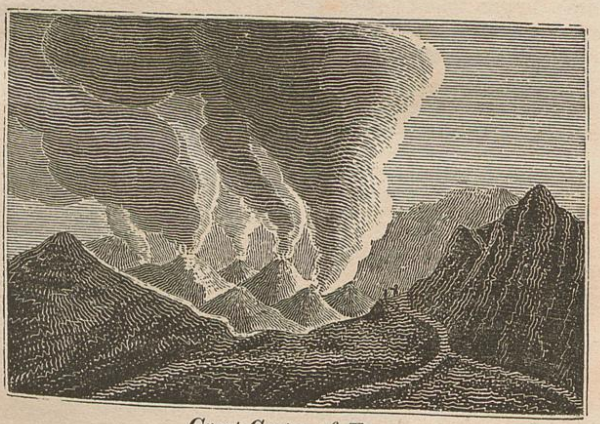
ference of 204 feet. Many of the oaks also are of a prodigious size. Mr. Swinburne measured one which had a circumference of 28 feet. The last, or desert region, commences more than a mile above the level of the sea. The lower part is covered with snow in winter only; but on the upper half of this sterile district the snows constantly lie.

> Sometimes the pencil, in cool airy halls,
> Bade the gay bloom of vernal landscapes rise,
> Or Autumn's varied shades imbrown the walls:
> Now the black tempest strikes th' astonished eyes,
> Now down the steep the flashing torrent flies;
> The trembling sun now plays o'er ocean blue,
> And now rude mountains frown amid the skies;
> Whate'er Lorraine light-touched with soft'ning hue,
> Or savage Rosa dashed, or learned Poussin drew.
>
> THOMSON.

The upper part, which may properly be called the cone of Etna, is, in a right line, about a mile, or somewhat more, in ascent. It is described by Sir William Hamilton as a little mountain, about a quarter of a mile perpendicular, and very steep, situated in the middle of a gently-inclined plane, about nine miles in circumference. The cavity was, according to his perception, shaped like a funnel, diminishing until it terminated in a point, and having an outer circumference of two miles and a half round. Great changes have since taken place. Spallanzani also reached the edge of the crater, and found it to be an oval of about a mile and a half in circuit, having its edges in many places indented by projecting lavas or scoriæ. The bottom was nearly a horizontal plane, about two-thirds of a mile in circumference; hence issued a constant column of smoke; and hence, as well as from the sides, arose several streams of smoke, resembling thin clouds. Within the aperture a liquid ignited matter was clearly seen, constantly undulating, boiling, rising and falling, without spreading over the bottom. This was, no doubt, the melted lava which had issued from the bottom of the gulf. Neither of the above travellers, nor Brydone, dared to venture down the crater, which they found too hot; but M. D'Orville, more adventurous, by the means of ropes, which two or three men held at a distance, descended as far as possible. His



Stromboli.



Great Crater of Etna.

view was, in a great measure, intercepted by the small flames and smoke; but in the centre he saw a mass of matter, which rose in the shape of a cone, to the height of about sixty feet.

On the vastness and beauty of the prospect, from the summit of Etna, all authors agree; and Spallanzani observes, that there is not, perhaps, any elevated region on the whole globe which offers at one view so fine an extent of sea and land. M. Houel was stationed there at sun-rise, when the horizon was clear, and without a single cloud. The coast of Calabria was, he says, undistinguishable from the adjoining sea; but in a short time a fiery radiance began to appear from behind those Italian hills which bounded the eastern part of the prospect. The fleecy clouds which generally appear early in the morning, were tinged with purple; the atmosphere became strongly illuminated, and, reflecting the rays of the sun, seemed to be filled with a bright refulgence of flame. Although the heavens were thus enlightened, the sea still retained its dark azure, and the fields and forests did not yet reflect the rays of the sun. The gradual rising of this luminary, however, soon diffused light over the hills which lie below the peak of Etna. This last stood like an island in the midst of the ocean, with luminous points multiplying every moment around, and spreading over a wider extent with the greatest rapidity. It was, said he, as if the world had been observed suddenly to spring from the night of non-existence.

Ere the rising sun
Shone o'er the deep, or 'mid the vault of night
The moon her silver lamp suspended: ere
The vales with springs were watered, or with groves
Of oak or pine the ancient hills were crowned;
Then the Great Spirit, whom his works adore,
Within his own deep essence viewed the forms,
The forms eternal of created things:
The radiant sun; the moon's nocturnal lamp;
The mountains and the streams: the ample stores
Of earth, of heaven, of Nature. From the first,
On that full scene his love divine he fixed,
His admiration. Till, in time complete,
What he admired and loved his vital power
Unfolded into being. Hence the breath
Of life informing each organic frame;

Hence the green earth, and wild resounding waves;
Hence light and shade, alternate; warmth and cold;
And bright autumnal skies, and vernal showers,
And all the fair variety of things. AKENSIDE.

The most sublime object, however, which the summit of Etna presents, is the immense mass of its own colossal body. Its upper region exhibits rough and craggy cliffs, rising perpendicularly, fearful to the view, and surrounded by an assemblage of fugitive clouds, to increase the wild variety of the scene. Amid the multitude of woods in the middle or temperate region, are numerous mountains, which, in any other situation, would appear of a gigantic size, but which, compared to Etna, are mere mole-hills. Lastly, the eye contemplates with admiration the lower region, the most extensive of the three, adorned with elegant villas and castles, verdant hills and flowery fields, and terminated by the extensive coast, where, to the south, stands the beautiful city of Catania, to which the waves of the neighbouring sea serve as a mirror.

Etna has been celebrated as a volcano from the remotest antiquity. Eruptions are recorded by Diodorus Siculus as having happened 500 years before the Trojan war, or 1698 years before the Christian era.

Ætna roars with dreadful ruins nigh,
Now hurls a bursting cloud of cinders high,
Involved in smoky whirlwinds to the sky;
With loud displosion to the starry frame,
Shoots fiery globes, and furious floods of flame:
Now from her bellowing caverns burst away
Vast piles of melted rocks in open day.
Her shattered entrails wide the mountain throws,
And deep as hell her flaming centre glows.
WARTON

In 1669, the torrent of burning lava inundated a space fourteen miles in length, and four in breadth, burying beneath it a part of Catania, till at length it precipitated itself into the sea. For several months before the lava broke out, the old mouth, or great crater of the summit, was observed to send forth much smoke and flame, and the top had fallen in, so that the mountain was much lowered.

Eighteen days before, the sky was very thick and dark,

with thunder, lightning, frequent concussions of the earth, and dreadful subterraneous bellowings. On the 11th of March, about sun-set, an immense gulf opened in the mountain, into which when stones were thrown, they could not be heard to strike the bottom. Ignited rocks, fifteen feet in length, were hurled to the distance of a mile; while others of a smaller size were carried three miles. During the night, the red-hot lava burst out of a vineyard twenty miles below the great crater, and ascended into the air to a considerable height. In its course it destroyed 5000 habitations, and filled up a lake several fathoms deep. It shortly after reached Catania, rose over the walls, whence it ran for a considerable length into the sea, forming a safe and beautiful harbour, which was, however, soon filled up by a similar torrent of inflamed matter. This is the stream, the hideous deformity of which, devoid of vegetation, still disfigures the south and western borders of Catania, and on which part of the noble modern city is built.

The showers of scoriæ and sand which, after a lapse of two days, followed this eruption, formed a mountain called *Monte Rosso*, having a base of about two miles, and a perpendicular height of 750 feet. On the 25th, the whole mountain, even to the most elevated peak, was agitated by a tremendous earthquake. The highest crater of Etna, which was one of the loftiest part of the mountain, then sunk into the volcanic gulf, and in the place which it had occupied, there now appeared nothing but a wide gulf, more than a mile in extent, from which issued enormous quantities of smoke, ashes, and stones.

In 1809, twelve new craters opened about half way down the mountain, and threw out rivers of burning lava, by which several estates were covered to the depth of thirty or forty feet; and during three or four successive nights a very large river of red hot lava was distinctly seen, in its whole extent, running down from the mountain.

In 1811, several mouths opened on the eastern side of the mountain: being nearly in the same line, and at equal distances, they presented to the view a striking spectacle,—torrents of burning matter, discharged with the greatest force from the interior of the volcano, illuminated the horizon to a great extent. An immense quantity of matter, which was driven to considerable distances, was dis-

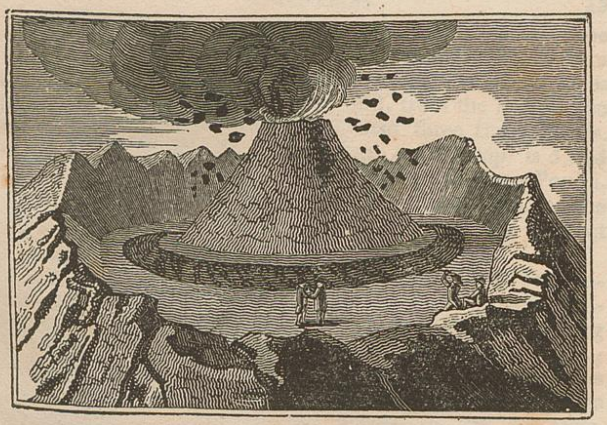
charged from these apertures, the largest of which continued for several months to emit torrents of fire. Even at the time when it had the appearance of being choked, there suddenly issued from it clouds of ashes, which descended, in the form of rain, on the city of Catania and its environs, as well as on the fields situated at a very considerable distance. A roaring, resembling that of the sea in the midst of a tempest, was heard to proceed from the inferior of the mountain; and this sound, accompanied from time to time by dreadful explosions, resembling thunder, re-choed through the vallies and spread terror on every side.

MOUNT VESUVIUS,

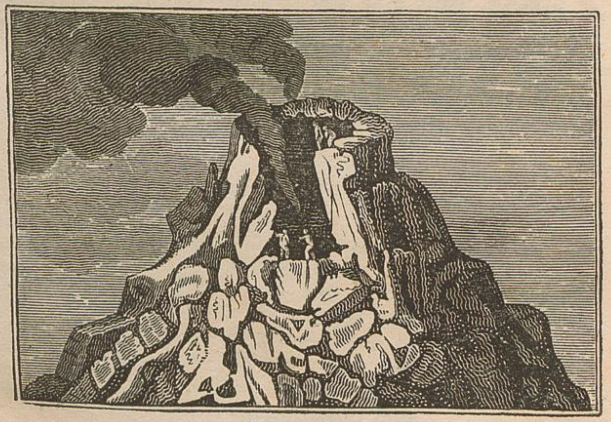
NEAR NAPLES.

The fluid lake that works below,
Bitumen, sulphur, salt, and iron scum,
Heaves up its boiling tide. The lab'ring mount
Is torn with agonizing throes. At once,
Forth from its side disparted, blazing pours
A mighty river; burning in prone waves,
That glimmer thro' the night, to yonder plain
Divided there, a hundred torrent streams,
Each ploughing up its bed, roll dreadful on,
Resistless. Villages, and woods, and rocks,
Fall flat before their sweep. The region round,
Where myrtle walks and groves of golden fruit
Rose fair; where harvest waved in all its pride;
And where the vineyard spread its purple store,
Maturing into nectar; now despoiled
Of herb, leaf, fruit and flower, from end to end
Lies buried under fire, a glowing sea! MALLET.

THIS celebrated volcano, which has for so many ages attracted the attention of mankind, and the desolating eruptions of which have been so often and so fatally experienced, is distant, in an eastern direction, about seven miles from Naples. It rises, insulated, upon a vast and well-cultivated plain, presenting two summits on the same base, in which particular it resembles Mount Parnassus. One of these, La Somma, is generally agreed to have been the Vesuvius of Strabo and the ancients; the other, having the greatest elevation, is the mouth of the volcano, which almost constantly emits smoke. Its height above the



Interior of the Crater of Vesuvius.



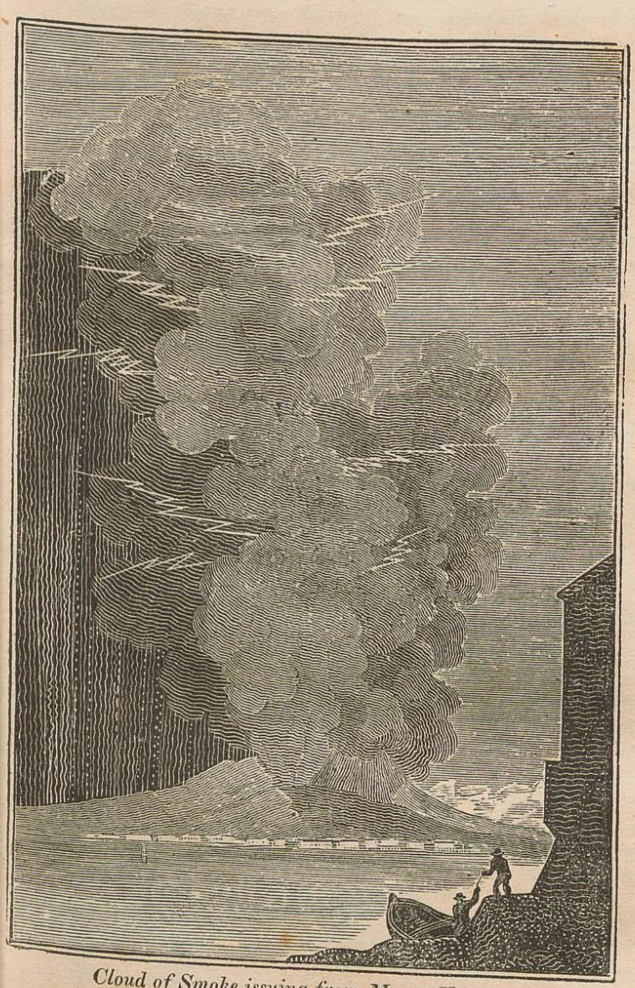
Crater of Etna.

level of the sea, is 3,900 feet, and it may be ascended by three different routes, which are all very steep and difficult, from the conical form of the mountain, and the loose ashes which slip from under the feet: still, from the base to the summit the distance is not more than three Italian miles. The circumference of the platform on the top, is 5,024 feet, or nearly a mile. Thence may be seen Portici, Capræa, Ischia, Pausilippo, and the whole coast of the gulf of Naples, bordered with orange trees: the prospect is that of Paradise seen from the infernal regions.

On approaching the mountain, its aspect does not convey any impression of terror, nor is it gloomy, being cultivated for more than two-thirds of its height, and having its brown top alone barren. There all verdure ceases; yet, when it appears covered with clouds, which sometimes encompass its middle only, this circumstance rather adds to than detracts from the magnificence of the spectacle. Upon the lavas which the volcano long ago ejected, and which, like great furrows, extend into the plain, and to the sea, are built houses, villages, and towns. Gardens, vineyards, and cultivated fields, surround them; but a sentiment of sorrow, blended with apprehensions about the future, arises on the recollection that, beneath a soil so fruitful and so smiling, lie edifices, gardens, and whole towns swallowed up. Portici rests upon Herculaneum; its environs upon Resina; and at a little distance is Pompeii, in the streets of which, after more than seventeen centuries of non-existence, the astonished traveller now walks. After a long interval of repose, in the first year of the reign of Titus, (the seventy-ninth of the Christian era,) the volcano suddenly broke out, ejecting thick clouds of ashes and pumice-stones, beneath which Herculaneum, Stabia, and Pompeii, were completely buried. This eruption was fatal to the elder Pliny, the historian, who fell a victim to his humanity and love of science. Even at this day, in speaking of Vesuvius, the remembrance of his untimely death excites a melancholy regret. All the coast to the east of the gulf of Naples was, on the above occasion, ravaged and destroyed, presenting nothing but a long succession of ejected matters from Herculaneum to Stabia. The destruction did not, however, extend to the western part, but stopped at Naples, which suffered comparatively little.

Thirty-eight eruptions of Vesuvius are recorded in history up to the year 1806. That of 1779 has been described by Sir William Hamilton as among the most remarkable from its extraordinary and terrific appearance. During the whole of July the mountain was in a state of considerable fermentation, subterraneous explosions and rumbling noises being heard, and quantities of smoke thrown up with great violence, sometimes with red-hot stones, scoriæ, and ashes. On the 5th of August the volcano was greatly agitated, a white sulphureous smoke, apparently four times the height and size of the volcano itself, issuing from the crater, at the same time that vast quantities of stones, &c. were thrown up to the supposed height of 2000 feet. The liquid lava, having cleared the rim of the crater, flowed down the sides of the mountain to the distance of four miles. The air was darkened by showers of reddish ashes, blended with long filaments of a vitrified matter resembling glass.

On the 7th, at midnight, a fountain of fire shot up from the crater to an incredible height, casting so bright a light that the smallest objects were clearly distinguishable at any place within six miles of the volcano. On the following evening, after a tremendous explosion, which broke the windows of the houses at Portici, another fountain of liquid fire rose to the surprising height of 10,000 feet, (nearly two miles,) while puffs of the blackest smoke accompanied the red-hot lava, interrupting its splendid brightness here and there by patches of the darkest hue. The lava was partly directed by the wind towards Ottaiano, on which so thick a shower of ashes, blended with vast pieces of scoriæ, fell, that, had it been of longer continuance, that town would have shared the fate of Pompeii. It took fire in several places; and had there been much wind, the inhabitants would have been burned in their houses, it being impossible for them to stir out. To add to the horror of the scene, incessant volcanic lightning darted through the black cloud which surrounded them, while the sulphureous smell and heat would scarcely allow them to draw their breath. In this dreadful state they remained nearly half an hour. The remaining part of the lava, still red-hot and liquid, fell on the top of Vesuvius, and covered its whole cone, together with that of La Somma, and the valley



Cloud of Smoke issuing from Mount Vesuvius.

between them, thus forming one complete body of fire, which could not be less than two miles and a half in breadth, and casting a heat to the distance of at least six miles around.

The eruption of 1794 is accurately described by the above writer; but has not an equal degree of interest with the one cited above. We subjoin a few particulars, among which is a circumstance well deserving notice, as it leads to an estimate of the degree of heat in volcanoes. Sir William says that, although the town of Torre del Greco was instantly surrounded with red-hot lava, the inhabitants saved themselves by coming out of the tops of their houses on the following day. It is evident, observes Mr. Kirwan, that if this lava had been hot enough to melt even the most fusible stones, these persons must have been suffocated.

This eruption happened on the 15th of June, at ten o'clock at night, and was announced by a shock of an earthquake, which was distinctly felt at Naples. At the same moment a fountain of bright fire, attended with a very black smoke and a loud report, was seen to issue, and rise to a considerable height, from about the middle of the cone of Vesuvius. It was hastily succeeded by other fountains, fifteen of which were counted, all in a direct line, tending, for the space of about a mile and a half downward, towards the towns of Resina and Torre del Greco. This fiery scene—this great operation of nature—was accompanied by the loudest thunder, the incessant reports of which, like those of a numerous heavy artillery, were attended by a continued hollow murmur, similar to that of the roaring of the ocean during a violent storm. Another blowing noise resembled that of the ascent of a large flight of rockets. The houses at Naples were for several hours in a constant tremour, the doors and windows shaking and rattling incessantly, and the bells ringing. At this awful moment the sky, from a bright full-moon and star-light, became obscured; the moon seemed eclipsed, and was soon lost in obscurity. The murmur of the prayers and lamentations of a numerous population, forming various processions, and parading the streets, added to the horrors of the scene

On the following day a new mouth was opened on the

opposite side of the mountain, facing the town of Ottaiano: from this aperture a considerable stream of lava issued, and ran with great velocity through a wood, which it burnt; but stopped, after having run about three miles in a few hours, before it reached the vineyards and cultivated lands. The lava, which had flowed from several new mouths on the south-side of the mountain, reached the sea, into which it ran, after having overwhelmed, burnt, and destroyed the greater part of Torre del Greco, through the centre of which it took its course. This town contained about 18,000 inhabitants, all of whom escaped, with the exception of about fifteen, who, through age or infirmity, were overwhelmed in their houses by the lava. Its rapid progress was such, that the goods and effects were entirely abandoned.

It was ascertained some time after, that a considerable part of the crater had fallen in, so as to have given a great extension to the mouth of Vesuvius, which was conjectured to be nearly two miles in circumference. This sinking of the crater was chiefly on the west-side, opposite Naples, and, in all probability, occurred early in the morning of the 18th, when a violent shock of an earthquake was felt at Resina, and other places situated at the foot of the volcano. The clouds of smoke which issued from this now widely-extended mouth of Vesuvius, were of such a density as to appear to force their passage with the utmost difficulty. One cloud heaped itself on another, and, succeeding each other incessantly, they formed in a few hours such a gigantic and elevated column, of the darkest hue, over the mountain, as seemed to threaten Naples with immediate destruction, it having at one time been bent over the city, and appearing to be much too massive and ponderous to remain long suspended in the air.

From the above time until 1804 Vesuvius remained in a state of almost constant tranquillity. Symptoms of a fresh eruption had manifested themselves for several months, when at length, on the night of the 11th of August, a deep roaring was heard at the Hermitage of Salvador, and the places adjacent to the mountain, accompanied by shocks of an earthquake, which were sensibly felt at Resina. On the following morning, at noon, a thick black smoke rose from the mouth of the crater, which, dilating

prodigiously, covered the whole volcano. In the evening loud explosions were heard; and at Naples a column of fire was seen to rise from the aperture, carrying up stones in a state of complete ignition, which fell again into the crater. The noise by which these igneous explosions were accompanied resembled the roaring of the most dreadful tempest, and the whistling of the most furious winds; while the celerity with which the substances were ejected was such, that the first emission had not terminated when it was succeeded by a second. Small monticules were at this time formed of a fluid matter, resembling a vitreous paste of a red colour, which flowed from the mouth of the crater; and these became more considerable in proportion as the matter accumulated.

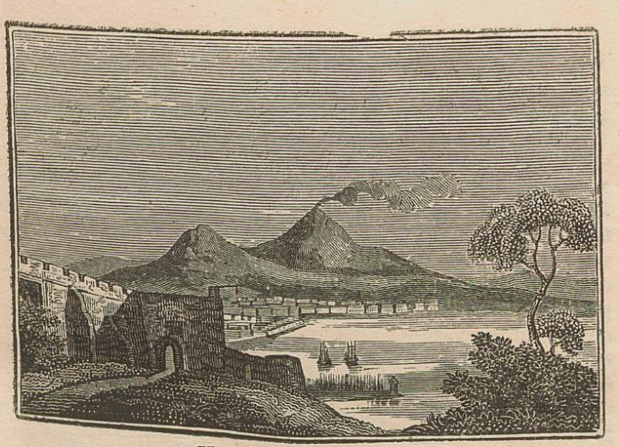
In this state the eruption continued for several days, the fire being equally intense, with frequent and dreadful noises. On the 28th, amid these fearful symptoms, another aperture, ejecting fire and stones, situated behind the crater, was seen from Naples. The burning mass of lava which escaped from the crater on the following day, was distinguished from Torre del Greco, having the appearance of a vitreous fluid, and advancing towards the base of the mountain between the south and south-west. It reached the base on the 30th, having flowed from the aperture, in less than twenty-four hours, a distance of 3,053 feet, while its mean breadth appeared to be about 350, but at the base 860 feet. In its course it divided into four branches, and finally reached a spot called the Guide's Retreat. Its entire progress to this point was more than a mile, so that, taking a mean proportion, this lava flowed at the rate of eighty-six feet an hour.

At the time of this eruption Kotzebue was at Naples. Vesuvius lay opposite to his window, and when it was dark he could clearly perceive in what manner the masses of fire rolled down the mountain. As long as any glimmering of light remained, that part of the mountain was to be seen, on the declivity of which the lava formed a straight but oblique line. As soon, however, as it was perfectly dark, and the mountain itself had vanished from the eye, it seemed as if a comet with a long tail stood in the sky. The spectacle was awful and grand!

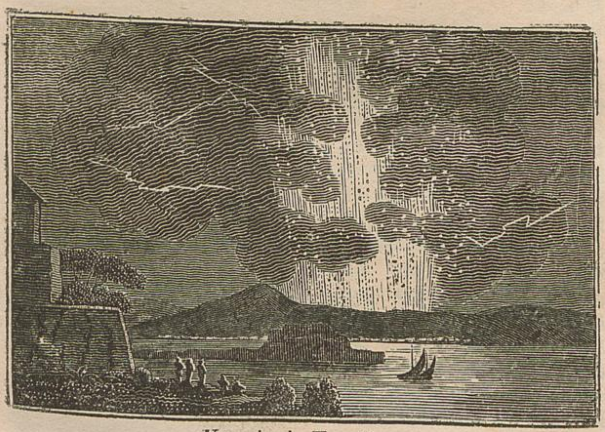
He ascended the mountain on the morning succeeding

the opening of a new gulf, and approached the crater as nearly as prudence would allow. From its centre ascended the sulphureous yellow cone which the eruption of this year had formed: on the other side, a thick smoke perpetually arose from the abyss opened during the preceding night. The side of the crater opposite to him, which rose considerably higher than that on which he stood, afforded a singular aspect; for it was covered with little pillars of smoke, which burst forth from it, and had some resemblance to extinguished lights. The air over the crater was actually embodied, and was clearly to be seen in a tremulous motion. Below, it boiled and roared dreadfully, like the most violent hurricane; but occasionally a sudden deadly stillness ensued for some moments, after which the roaring recommenced with double vehemence, and the smoke burst forth in thicker and blacker clouds. It was, he observes, as if the spirit of the mountain had suddenly tried to stop the gulf, while the flames indignantly refused to endure the confinement.

It is remarkable, that the great eruption of 1805 happened on the 12th of August, within a day of that of the preceding year Subterraneous noises had been previously heard, and a general apprehension of some violent commotion prevailing, the inhabitants of Torre del Greco and Annunciada had left their homes, through the apprehension of a shower of fire and ashes, similar to that which buried Pompeii. The stream of lava took the same course with that of 1794, described above, one of the arms following the direction of the great road, and rolling towards the sea. The stream soon divided again, and spreading itself with an increased celerity, swept away many houses and the finest plantations. The other branch, at first, took the direction of Portici, which was threatened; but turning, and joining the preceding one, formed a sort of islet of boiling lava in the middle, both ending in the sea, and composing a promontory of volcanic matters. In the space of twenty minutes the whole extent of ground which the lava occupied was on fire, offering a terrible yet singular spectacle, as the burning trees presented the aspect of white flames, in contrast with those of the volcanic matters, which were red. The lava swept along with it enormous masses of whatever occurred in its course, and, on its



Vesuvius and Naples.



Vesuvius in Eruption.

reaching the sea, nothing was to be seen or heard for a great extent of shore, beside the boiling and hissing arising from the conflict of the water and fire.

It remains now to introduce a slight notice of the eruption of 1806, which, without any sensible indication, took place on the evening of the 31st of May, when a bright flame rose from the mountain to the height of about 600 feet, sinking and rising alternately, and affording so clear a light, that a letter might have been read at the distance of a league around the mountain. On the following morning, without any earthquake preceding, as had been customary, the volcano began to eject inflamed substances from three new mouths, pretty near to each other, and about 650 feet from the summit. The lava took the direction of Torre del Greco and Annunciata, approaching Portici, on the road leading from Naples to Pompeii. Throughout the whole of the second of June, a noise was heard, resembling that of two armies engaged, when the discharges of artillery and musketry are very brisk. The current of lava now resembled a wall of glass in a state of fusion, sparks and flashes issuing from it from time to time, with a powerful detonation. Vines, trees, houses,—whatever objects, in short, it encountered on its way, were instantly overthrown or destroyed. In one part, where it met with the resistance of a wall, it formed a cascade of fire. In a few days, Portici, Resina, and Torre del Greco, were covered with ashes thrown out by the volcano; and, on the ninth, the two former places were deluged with a thick black rain, consisting of a species of mud filled with sulphureous particles. On the 1st of July, the ancient crater had wholly disappeared, being filled with ashes and lava, and a new one was formed in the eastern part of the mountain, about 600 feet in depth, and having about the same width at the opening. Several persons, on the above day, descended about half way down this new mouth, and remained half an hour very near the flames, admiring the spectacle presented by the liquid lava, which bubbled up at the bottom of the crater, like the fused matter in a glass-house. This eruption continued until September, made great ravages, and was considered as one of the most terrible that had occurred in the memory of the inhabitants.

MOUNT HECLA,

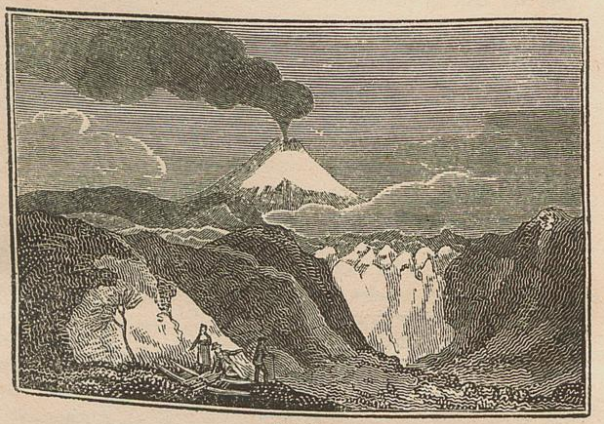
IN ICELAND.

Still pressing on beyond Tornea's lake,
And Hecla flaming through a waste of snow,
And farthest Greenland, to the Pole itself,
Where, falling gradual, life at length goes out,
The Muse expands her solitary flight;
And hov'ring o'er the wide stupendous scene,
Beholds new scenes beneath another sky.
Throned in his palace of cerulean ice,
Here Winter holds his unrejoicing court,
And through his airy hall the loud misrule
Of driving tempest is for ever heard;
Here the grim tyrant meditates his wrath;
Here arms his winds with all subduing frost,
Moulds his fierce hail, and treasures up his snows.

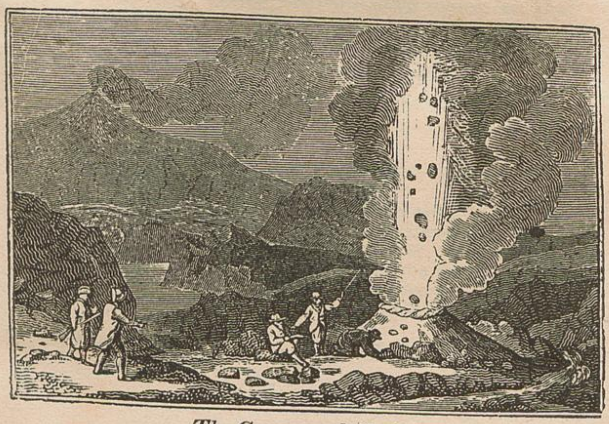
On proceeding along the southern coast of Iceland, and at an inconsiderable distance from Skaalholt, this mountain, with its three summits, presents itself to the view. Its height is five thousand feet, or nearly a mile above the level of the sea. It is not a promontory, but lies about four miles inland. It is neither so elevated nor so picturesque as several of the surrounding Icelandic mountains; but has been more noticed than many other volcanoes of an equal extent, partly through the frequency of its eruptions, and partly from its situation, which exposes it to the view of many ships sailing to Greenland and North America. The surrounding territory has been so devastated by these eruptions, that it has been deserted.

Vast regions dreary, bleak, and bare!
There on an icy mountain's height,
Seen only by the Moon's pale light,
Stern Winter rears his giant form,
His robe a mist, his life a storm:
His frown the shiv'ring nations fly,
And, hid for half the year, in smoky caverns lie

The natives asserted that it was impossible to ascend the mountain, on account of the great number of dangerous bogs, which, according to them, are constantly emitting sulphureous flames, and exhaling smoke; while the



Hecla.



The Geysers and Hecla.

more elevated summit in the centre is covered with boiling springs and large craters, which continually propel fire and smoke. To the south and west the environs present the most afflicting results of frequent eruptions, the finest part of the territory being covered by torrents of melted stone, sand, ashes, and other volcanic matter; notwithstanding which, between the sinuosities of the lava in different parts, some portion of meadows, walls, and broken hedges may be observed. The devastation is still greater on the north and east sides, which present dreadful traces of the ruin of the country and its habitations. Neither plants nor grass are to be met with to the extent of two leagues round the mountain, in consequence of the soil being covered with stones and lava; and in some parts, where the subterraneous fire has broken out a second time, or where the matter which was not entirely consumed has again become ignited, the fire has contributed to form small red and black hillocks and eminences, from scoriæ, pumice-stones, and ashes. The nearer the mountain the larger are these hillocks, and there are some of them, the summits of which form a circular hollow, whence the subterraneous fire ejects the matter. On approaching Hecla the ground becomes almost impassable, particularly near the higher branches of lava thrown from the volcano. Round the latter is a mountain of lava, consisting of large fused stones, from forty to seventy feet high, and in the form of a rampart or wall. These stones are detached, and chiefly covered with moss; while between them are very deep holes, so that the ascent on the western side requires great circumspection. The rocks are completely reduced to pumice, dispersed in thin horizontal layers, and fractured in every direction, from which some idea may be formed of the intensity of the fire that has acted on them.

There Winter, armed with terrors here unknown,
Sits absolute on his unshaken throne;
Piles up his stores amidst the frozen waste,
And bids the mountains he has built, stand fast,
Beckons the legions of his storms away
From happier scenes to make the land a prey;
Proclaims the soil a conquest he has won,
And scorns to share it with the distant sun.

Sir Joseph Banks, Dr. Solander, Dr. James Lind, of

Edinburgh, and Dr. Van Troil, a Swede, were the earliest adventurous travellers who ascended to the summit of Mount Hecla. This was in 1772; and the attempt was facilitated by a preceding eruption in 1766, which had greatly diminished the steepness and difficulty of the ascent. On their first landing, they found a tract of land sixty or seventy miles in extent, entirely ruined by lava, which appeared to have been in a state of complete liquefaction. To accomplish their undertaking, they had to travel from three hundred to three hundred and sixty miles over uninterrupted tracts of lava. In ascending, they were obliged to quit their horses at the first opening from which the fire had burst:—a spot, which they describe as presenting lofty glazed walls and high glazed cliffs, differing from any thing they had ever seen before. At another opening above, they fancied they discerned the effects of boiling water; and not far from thence, the mountain, with the exception of some bare spots, was covered with snow. This difference of aspect they soon perceived to be occasioned by the hot vapour ascending from the mountain. The higher they proceeded, the larger these spots became; and, about two hundred yards below the summit, a hole about a yard and a half in diameter, was observed, whence issued so hot a steam, that they could not measure the degree of heat with a thermometer. The cold now began to be very intense. Fahrenheit's thermometer, which at the foot of the mountain was at 54, fell to 24; while the wind became so violent, that they were sometimes obliged to lie down, from a dread of being blown into the most dreadful precipices. On the summit itself they experienced, at one and the same time, a high degree of heat and cold; for, in the air, Fahrenheit's thermometer constantly stood at 24, but when placed on the ground, it rose to 153.

Messrs. Olafsen and Povelsen, two naturalists, whose travels in Iceland were undertaken by order of his Danish Majesty, after a fatiguing journey up several small slopes, which occurred at intervals, and seven of which they had to pass, at length reached the summit of Mount Hecla at midnight. It was as light as at noon day, so that they had a view of an immense extent, but could perceive nothing but ice: neither fissures, streams of water, boiling springs, smoke, nor fire, were apparent. They surveyed the gla-

ciers in the eastern part, and in the distance saw the high and square mountain of Hærdabreid, an ancient volcano, which appeared like a large castle.

Sir G. S. Mackenzie, in his recent travels in Iceland, ascended Mount Hecla; and from his account we extract the following interesting particulars. In proceeding to the southern extremity of the mountain, he descended, by a dangerous path, into a valley, having a small lake in one corner, and the opposite extremity bounded by a perpendicular face of rock, resembling, in its broken and rugged appearance, a stream of lava. While advancing, the sun suddenly broke through the clouds, and the brilliant reflection of his beams, from different parts of this supposed lava, as if from a surface of glass, delighted our traveller by the instantaneous conviction that he had now attained one of the principal objects connected with the plan of his expedition to Iceland. He hastened to the spot, and all his wishes were fully accomplished in the examination of an object which greatly exceeded the expectations he had formed. On ascending one of the abrupt pinnacles, which rose out of this extraordinary mass of rock, he beheld a region, the desolation of which can scarcely be paralleled. Fantastic groups of hills, craters, and lava, leading the eye to distant snow-crowned jockuls, (inferior mountains,) the mist rising from a water-fall; lakes, embosomed among bare bleak mountains; an awful profound silence; lowering clouds; marks all around of the furious action of the most destructive of elements; all combined to impress the soul with sensations of dread and wonder. The longer himself and his companions contemplated this scene, the more unable they were to turn their eyes from it; and a considerable time elapsed before they could bring themselves to attend to the business which had tempted them to enter so frightful a district of the country.

Having proceeded a considerable distance along the edge of a stream of lava, a narrow part of which they crossed, they gained the foot of the south-end of Mount Hecla. While, in ascending, they had to pass over rugged lava, they experienced no great difficulty in advancing; but when they reached the steepest part of the mountain, which was covered with loose slags, they sometimes lost at

one step, by the yielding of these, a space which had been gained by several.

Having passed a number of fissures, by leaping across some, and stepping along masses of slags which lay over others, they at length reached the summit of the first peak. The clouds now became so thick, that they began to despair of being able to proceed any further: it was, indeed, dangerous even to move; for the peak consists of a very narrow ridge of slags, not more than two feet broad, having a precipice on each side, several hundred feet in depth. One of these precipices forms the side of a vast hollow, which seems to have been one of the craters. At length the sky cleared a little, and enabled them to discover a ridge below, which seemed to connect the peak they had ascended with the middle or principal one. They lost no time in availing themselves of this opportunity, and, by balancing themselves like rope-dancers, succeeded in passing along a ridge of slags, so narrow, that there was scarcely room for their feet. After a short, but very steep, ascent, they gained the highest part of this celebrated mountain.

Its earliest eruption is said to have happened in 1004, since which time upwards of twenty have occurred. That of 1693 was the most dreadful, and occasioned terrible devastations, the ashes having been thrown over the island in every direction, to the distance of more than one hundred miles. In 1728, a fire broke out among the surrounding lava; and also in that to the west of the volcano, in 1754, which lasted for three days. There has not been any eruption of lava since 1766; but for some years after flames issued from the volcano.

THE GEYSERS.

Nor stops the restless fluid, mounting still,
Tho' oft amid th' irriguous vale of springs;
But to the mountain courted by the sand,
That leads it darkling on in faithful maze,
Far from the parent-main, it boils again
Fresh into day; and all the glittering hill
Is bright with spouting rills.———

The crystal treasures of the liquid world,
Through the stirred sands a bubbling passage burst;
And welling out, around the middle steep,
Or from the bottoms of the bosomed hills,
In pure effusion flow. THOMSON.

THESE celebrated fountains, or hot spouting water springs, being nearly connected with the operations of subterraneous fire, so visible in every part of Iceland, may be properly introduced after the description of Mount Hecla, given above.

They are seldom very near the volcanoes, but are dispersed over the whole country, and are even to be found on the summits of several of the ice mountains. The largest and most remarkable of these is situated in a large field, about sixteen miles to the north of Skalholt. At a great distance from it, on one side, are high mountains covered with ice, and on the other Hecla is seen rising above the clouds, while opposite to it is a ridge of rocks, at the foot of which water from time to time rushes forth. At the distance of a mile and a half a loud roaring noise is heard, like that of a torrent precipitated from stupendous rocks, each ejection being accompanied by violent subterraneous detonations. The depth of the opening from which the water rushes has not been ascertained, but some seconds elapse before a stone thrown in reaches the surface. The Danish traveller, Olafsen, asserts, that the water rises as high as sixty fathoms; while Van Troil estimates the highest jet at not more than sixty feet: the latter allows, however, that the jets may be more elevated, particularly in bad weather. The greatness of the explosive power is evinced by its not only preventing stones thrown in from sinking, but even forcing them up to a very great height, together with the water, and splitting the pebbles into a thousand pieces. The heat was found by Van Troil to be two hundred and twelve degrees of Fahrenheit, the boiling point. The edges of the pipe or basin are covered by a coarse stalactitic rind, and the water has been found to have a petrifying quality. The opening is perfectly circular, in diameter nineteen feet, and forms above, on the surface of the ground, a basin fifty-nine feet in diameter, the edge of which is nine feet above the orifice or hole.

In speaking of the Geysers, or hot spouting springs,

Horrebow observes, that if you fill a bottle at one of them, the water it contains will boil up two or three times, at the same time with the water in the well. The inhabitants boil their meat in it, by putting the meat in a vessel of cold water, which they place in the hot spring.

Sir G. S. Mackenzie, whose recent travels in Iceland we have already cited, visited the Geysers at a season favourable to his observations, the latter end of July. He found the cultivation of the surrounding territory much higher than might have been inferred from the idea generally entertained of the barren and unproductive state of Iceland. All the flat ground in that quarter of the island was swampy, but not so much so as to impede the progress of the party, who, having passed several hot springs to the eastward of Skalholt, and others rising among the low hills they had left to the right, in proceeding to the great Geyser, came to a farm-house, situated on a rising ground in the midst of the bogs. Here the people were busily employed in making hay, a scene which afforded a pleasing change from the dreary solitude they had quitted: the whole of this extensive district, which abounds in grass, would, if drained, our traveller observes, prove a very rich pasture country. Farther on they came to several cottages at the foot of the mountain, round which they turned, and came in sight of the hill, having the Geysers at one of its sides. This hill, in height not more than three hundred feet, is separated from the mountain, towards the west, by a narrow slip of flat boggy ground, connected with that which extends over the whole valley. Having crossed this bog, and a small river which ran through it, the party came to a farm-house at the east-end of the hill, and arrived at a spot where the most wonderful and awful effects of subterraneous heat are exhibited.

On the east-side of the hill there are several banks of clay, from some of which steam rises in different places; and in others there are cavities, in which water boils briskly. In a few of these cavities, the water, being mixed with clay, is thick, and varies in colour; but is chiefly red and grey. Below these banks there is a gentle and uniform slope, composed of matter which, at some distant period, has been deposited by springs which no longer exist. The strata or beds thus formed, seemed to have been broken

by the shocks of earthquakes, particularly near the great Geyser. Within a space not exceeding a quarter of a mile, numerous orifices are seen in the old incrustations, from which boiling water and steam issue, with different degrees of force. At the northern extremity is situated the great Geyser, sufficiently distinguishable from the others by every circumstance connected with it. On approaching this spot, it appeared that a mount had been formed of irregular, rough-looking depositions, upon the ancient regular strata, the origin of which had been similar. The slope of the latter has caused the mount to spread more on the east-side; and the recent depositions of the water may be traced till they coincide with them. The perpendicular height of the mount is about seven feet, measured from the highest part of the surface of the old depositions. From these the matter composing the mount may be readily distinguished, on the west-side, where a disruption has taken place. On the top of this mount is a basin, which was found to extend fifty-six feet in one direction, and forty-six in another.

At a quarter before three o'clock in the afternoon, when the party reached the spot, they found the basin full of hot water, a little of which was running over. Having satisfied their curiosity at that time, they proceeded to examine some other places, whence they saw water ascending. Above the great Geyser, at a short distance, they came to a large irregular opening, the beauties of which, the writer observes, it is hardly possible to describe. The water with which it was filled was as clear as crystal, and perfectly still, although nearly at the boiling point. Through it they saw white incrustations, forming a variety of figures and cavities, to a great depth, and carrying the eye into a vast and dark abyss, over which the crust supporting them formed a dome of an inconsiderable thickness; a circumstance which, though not of itself agreeable, contributed much to the effects of this awful scene.

Having pitched their tent at the distance of about one hundred yards from the Geyser, and so arranged matters as that a regular watch might be kept during the night, Sir G. S. Mackenzie took his station at eleven o'clock, and his companions lay down to sleep. About ten minutes before twelve he heard subterraneous discharges, and waked his

friends. The water in the basin was greatly agitated, and flowed over, but there was not any jet. The same occurred at half past two. At five minutes past four on Saturday morning, an alarm was given by one of the company. As our traveller lay next the door of the tent, he instantly drew aside the canvas, when, at a distance of little more than fifty yards, a most extraordinary and magnificent appearance presented itself. From a place they had not before noticed, they saw water thrown up, and steam issuing with a tremendous noise. There was little water; but the force with which the steam escaped, produced a white column of spray and vapour, at least sixty feet high. They enjoyed this astonishing and beautiful sight until seven o'clock, when it gradually disappeared.

The remaining part of the morning was occupied in examining the environs of the Geysers; and at every step they received some new gratification. Following the channel which had been formed by the water escaping from the great basin during the eruptions, they found several beautiful and delicate petrifactions. The leaves of birch and willow were seen converted into white stone, and in the most perfect state of preservation, every minute fibre being entire. Grass and rushes were in the same state, and also masses of peat. Several of these rare and elegant specimens were brought safely to Great Britain. On the outside of the mount of the Geyser, the depositions, owing to the splashing of the water, are rough, and have been justly compared to the heads of cauliflowers. They are of a yellowish brown colour, and are arranged round the mount, somewhat like a circular flight of steps. The inside of the basin is comparatively smooth; and the matter forming it is more compact and dense than the exterior crust; when polished, it is not devoid of beauty, being of a grey colour, mottled with black and white spots and streaks. The white incrustation formed by the water of the beautiful cavity before described, had taken a very curious form at the water's edge, very much resembling the capital of a Gothic column.

THE SULPHUR MOUNTAIN.

THIS Icelandic mountain, distant about three miles from the village of Krisuvik, presents a phenomenon very different from the one above described, that of a CAULDRON OF BOILING MUD. We extract the following particulars of this singular curiosity from the relation given by Sir G. Mackenzie in his Travels in Iceland.

At the foot of the mountain is a small bank, composed chiefly of white clay and sulphur, from every part of which steam issues. Having ascended this bank, a ridge presents itself, immediately beneath which is a deep hollow, whence a profusion of vapour arises, with a confused noise of boiling and splashing, accompanied by steam escaping from narrow crevices in the rock. This hollow being, as well as the whole side of the mountain opposite, covered with sulphur and clay, it was very hazardous to walk over a soft and steaming surface of such a description. The vapour concealing the party from each other occasioned much uneasiness; and there was some hazard of the crust of sulphur breaking, or of the clay sinking beneath their feet. They were thus several times in danger of being scalded, as, indeed, happened to one of the party, Mr. Bright, who accidentally plunged one of his legs into the hot clay. When the thermometer was immersed in it, to the depth of a few inches, it generally rose to within a few degrees of the boiling point. By stepping cautiously, and avoiding every little hole from which steam issued, they soon ascertained how far they might venture. Their good fortune, however, Sir George observes, ought not to tempt any person to examine this wonderful place, without being provided with two boards, with which every part of the banks may be traversed in perfect safety. At the bottom of the hollow, above described, they found the cauldron of mud, which boiled with the utmost vehemence. They approached within a few yards of it, the wind favouring them in viewing every part of this singular scene. The mud was in constant agitation, and often thrown up to the height of six or eight feet. Near this spot was an irregular space filled with water, boiling briskly. At the foot of the

hill, in a hollow formed by a bank of clay and sulphur, steam rushed with great force and noise from among the loose fragments of rock.

In ascending the mountain, our travellers met with a spring of cold water, which was little to be expected in such a place. At a greater elevation, they came to a ridge, composed entirely of sulphur and clay, joining two summits of the mountain. The smooth crust of sulphur was beautifully crystallized; and beneath it was a quantity of loose granular sulphur, which appeared to be collecting and crystallizing, as it was sublimed along with the steam. On removing the sulphureous crust, steam issued, and annoyed the party so much, that they could not examine this place to any depth.

Beneath the ridge, on the farther side of this great bed of sulphur, an abundance of vapour escaped with a loud noise. Having crossed to the side of the mountain opposite, they walked to what is called the principal spring. This was a task of much apparent danger, as the side of the mountain, to the extent of about half a mile, was covered with loose clay, into which the feet of our travellers sunk at every step. In many places there was a thin crust, beneath which the clay was wet, and extremely hot. Good fortune attended them; and, without any serious inconvenience, they reached the object they had in view. A dense column of steam, mixed with a small portion of water, forced its way impetuously through a crevice in the rock, at the head of a narrow valley, or break in the mountain. The violence with which it rushed out was so great, that the noise, thus occasioned, might often be heard at the distance of several miles. During night, while the party lay in their tent at Krisuvik, they more than once listened to it with mingled awe and astonishment. Behind the column of vapour was a dark-coloured rock, which added to the sublimity of the effect.

"It is quite beyond my power," observes Sir George Mackenzie, "to offer such a description of this extraordinary place, as would convey adequate ideas of its wonders, or of its terrors. The sensations of a person, even of firm nerves, standing on a support which feebly sustains him, over an abyss where, literally, fire and brimstone are in dreadful and incessant action; having before his eyes tremendous

proofs of what is going on beneath him; enveloped in thick vapours; his ears stunned with thundering noises; must be experienced before they can be understood."

MONT BLANC,

IN SWITZERLAND, WITH THE GLACIERS.

When mid the lifeless summits proud
Of Alpine cliffs, where to the gelid sky
Snows piled on snows in wint'ry torpor lie,
The rays divine of vernal Phœbus play;
Th' awakened heaps, in streamlets from on high,
Roused into action, lively leap away,
Glad warbling through the vales, in their new being gay.
THOMSON.

THIS mountain, so named on account of its white aspect, belongs to the great central chain of the Alps. It is truly gigantic, and is the most elevated mountain in Europe, rising no less than 15,872 feet, somewhat more than three miles, above the level of the sea, and 14,624 feet above the Lake of Geneva, in its vicinity. It is encompassed by those wonderful collections of snow and ice, called "GLACIERS," two of the principal of which, are called Mont Dolent and Triolet. The highest part of Mont Blanc, named the Dromedary, is in the shape of a compressed hemisphere. From that point it sinks gradually, and presents a kind of concave surface of snow, in the midst of which is a small pyramid of ice. It then rises into a second hemisphere, which is named the Middle Dome; and thence descends into another concave surface, terminating in a point, which, among other names bestowed on it by the Savoyards, is styled "Dôme de Gouté," and may be regarded as the inferior dome.

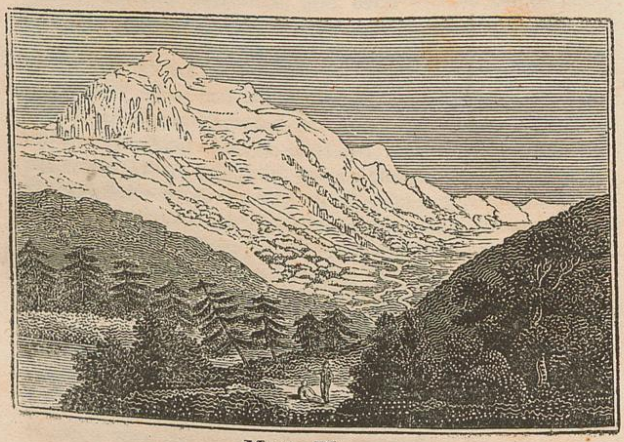
The first successful attempt to reach the summit of Mont Blanc was made in August 1786, by Doctor Paccard, a physician of Chamouni. He was led to make the attempt by a guide, named Balma, who, in searching for crystals, had discovered the only practicable route by which so arduous an undertaking could be accomplished. The ascent occupied fifteen hours, and the descent five, under circumstances of the greatest difficulty, the sight of the Doctor, and that of his guide, Balma, being so affected by the

snow and wind, as to render them almost blind, at the same time that the face of each was excoriated, and the lips exceedingly swelled.

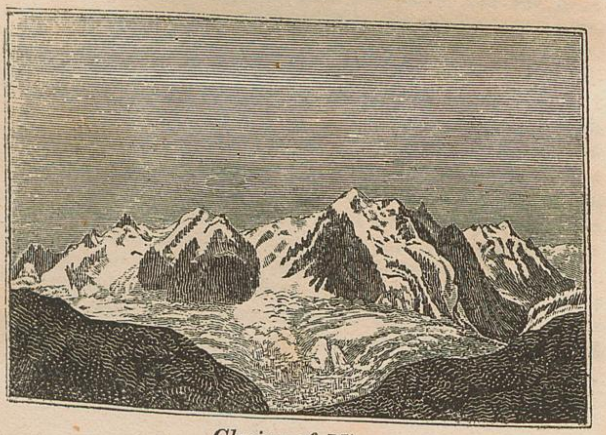
On the first of August of the following year, 1787, the celebrated and indefatigable naturalist, M. de Saussure, set out on his successful expedition, accompanied by a servant and eighteen guides, who carried a tent and mattresses, together with the necessary accommodations and various instruments of experimental philosophy. The first night they passed under the tent, on the summit of the mountain of La Côte, 4986 feet above "the Priory," a large village in the vale of Chamouni, the journey thither being exempt from trouble or danger, as the ascent is always over turf, or on the solid rock; but above this place it is wholly over ice or snows.

Early next morning they traversed the glacier of La Côte, to gain the foot of a small chain of rocks, inclosed in the snows of Mont Blanc. The glacier is both difficult and dangerous, being intersected by wide, deep, irregular chasms, which frequently can be passed only by three bridges of snow, which are suspended over the abyss. After reaching the ridge of rocks, the tract winds along a hollow, or valley, filled with snow, which extends north and south to the foot of the highest summit, and is divided at intervals by enormous crevices. These shew the snow to be disposed in horizontal beds, each of which answers to a year, and, notwithstanding the width of the fissures, the depth can in no part be measured. At four in the afternoon, the party reached the second of the three great platforms of snow they had to traverse, and here they encamped at the height of 9312 feet above the Priory, or 12,768 feet, nearly two miles and a half, above the level of the sea.

From the centre of this platform, enclosed between the farthest summit of Mont Blanc on the south, its high steps, or terraces, on the east, and the Dôme de Gouté on the west, nothing but snow appears. It is quite pure, of a dazzling whiteness, and on the high summits presents a singular contrast with the sky, which, in these elevated regions, is almost black. Here no living being is to be seen; no appearance of vegetation; it is the abode of cold and silence. "When," observes M. de Saussure, "I represent to myself Dr. Paccard and James Balma first



Mont Blanc,



Glaciers of Miage.

arriving, on the decline of day, in these deserts, without shelter, without assistance, and even without the certainty that men could live in the places which they proposed to reach, and still pursuing their career with unshaken intrepidity, it seems impossible to admire too much their strength of mind and their courage."

The company departed, at seven the next morning, to traverse the third and last platform, the slope of which is extremely steep, being in some places thirty-nine degrees. It terminates in precipices on all sides; and the surface of the snow was so hard, that those who went foremost were obliged to cut places for the feet with hatchets. The last slope of all presents no danger; but the air possesses so high a degree of rarity, that the strength is speedily exhausted, and on approaching the summit it was found necessary to stop at every fifteen or sixteen paces to take breath. At eleven they reached the top of the mountain, where they continued four hours and a half, during which time M. de Saussure enjoyed, with rapture and astonishment, a view the most extensive as well as the most rugged and sublime in nature, and made those observations which have rendered this expedition important to philosophy.

A light vapour, suspended in the lower regions of the air, concealed from the sight the lowest and most remote objects, such as the plains of France and Lombardy; but the whole surrounding assemblage of high summits appeared with the greatest distinctness.

M. de Saussure descended with his party, and the next morning reached Chamouni, without the smallest accident. As they had taken the precaution to wear veils of crape, their faces were not excoriated, nor their sight debilitated. The cold was not found to be so extremely piercing as it was described by Dr. Paccard. By experiments made with the hygrometer on the summit of the mountain, the air was found to contain a sixth portion only of the humidity of that of Geneva; and to this dryness of the air M. de Saussure imputes the burning thirst which he and his companions experienced. The balls of the electrometer diverged three lines only, and the electricity was positive. It required half an hour to make water boil, while at Geneva fifteen or sixteen minutes sufficed, and twelve or thirteen at the sea side. Not any of the party discovered

the smallest difference in the taste or smell of bread, wine, meat, fruits, or liquors, as some travellers have pretended is the case at great heights; but sounds were of course much weakened, from the want of objects of reflection. Of all the organs, that of respiration was the most affected, the pulse of one of the guides beating ninety-eight times in a minute, that of the servant one hundred and twelve, and that of M. de Saussure one hundred and one; while at Chamouni the pulsations respectively were forty-nine, sixty, and seventy-two. A few days afterwards, Mr. Beaufoy, an English gentleman, succeeded in a similar attempt, although it was attended with greater difficulty, arising from enlargements in the chasms in the ice.

THE GLACIERS, OR ICE MASSES.

The three great Glaciers, or Ice mountains, which descend from the flanks of Mont Blanc, add their ice to that of the Miage, and present a majestic spectacle, amid the astonishing succession of icy summits, of deep vallies, and of wide chasms, which have become channels for the innumerable torrents and cataracts with which these mountains abound. The view which the Glacier of Talafre affords from its centre, looking towards the north, is as extraordinary as beautiful. It rises gradually to the base of a semicircular girdle, formed of peaks of granite of a great height, and terminating in sharp summits, extremely varied in their forms; while the intervals between these peaks are filled up by ice, which falls into this mass, and this mass of ice is crowned by masses of snow, rising in festoons between the black and vertical tables of granite, the steepness of which does not allow them to remain. A ridge of shattered wrecks divides this glacier lengthwise, and forms its most elevated part, being 8538 feet, upwards of a mile and a half, above the level of the sea. This prospect has nothing in common with what is seen in other parts of the world. The immense masses of ice, surrounded and surmounted by pyramidal rocks, still more enormous in magnitude; the contrast between the whiteness of the snows and the obscure colours of the stones, moistened by the water which trickles down their sides; the purity of the air; the dazzling light of the sun, which gives to these

objects extraordinary brilliancy, the majestic and awful silence which reigns in these vast solitudes—a silence which is only interrupted at intervals by the noise of some great mass of granite, or of ice, tumbling from the top of the mountain; and the nakedness of these elevated rocks themselves, on which neither animals, shrubs, nor verdure, are to be seen, combined with the recollection of the fertile country and rich vegetation which the adjacent vallies at so small a distance present; tend to produce a mixed impression of admiration and terror, which tempts the spectator to believe, that he has been suddenly transported into a world forgotten by the great Author of Nature.

The glacier of Triolet is covered with the wrecks of another ice-mountain, which fell some years ago, and buried many huts, flocks, and shepherds beneath its ruins.

VIEW FROM THE BUET.

Before we take our leave of Mont Blanc and of the Alps, the peculiarly brilliant view from the summit of the Buet ought to be noticed. Never, says M. Bourrit, did prospect appear so vast. Towards the west the Rhone is seen, winding for a space of thirty-six leagues through the rich plains of the Valais; the parts of the river which the mountains cover with their shade seeming like threads of silver, and those which the sun illumines like threads of gold. Beyond the river and its rich plains, the view extends to the highest mountains of Switzerland, St. Gothard, and the Grisons, all covered with ice; while, on the east, the heights sink suddenly, from some of the loftiest elevations on the globe, to level plains washed by the sea. Geneva seems like a spot at one end of the lake, and the lake itself like a sinuous band, dividing the fields which it waters. Beyond it are discovered the vast plains of Franche Comté and Burgundy, the mountains of which diminish by almost imperceptible gradations. Here the eye has neither power nor extent of sight to embrace the whole of the objects presented to its view. Amid the fearful aspect of the precipices which descend on every side, what a contrast between the country decorated with all that is smiling and gay, and the sublime spectacle of the Alps, their gloomy and aspiring summits, and, above all, the prodigious height

of Mont Blanc, that enormous colossus of snow and ice, which parts the clouds, and pierces to the very heavens! Below this mountain, which bids defiance to time, and whose eternal ice disregards the dissolving power of the sun, a band of pyramidal rocks appears, the intervals between them being so many vallies of ice, the immensity of which appals the imagination. Their deep chasms may be distinguished, and the noise of the frequent *avalanches* (falls of immense masses of snow,) presents to the mind the gloomy ideas of horror, devastation, and ruin. Farther on, other summits of ice prolong this majestic picture. Among these are the high mountains of the St. Bernard, and those which border on the Boromean islands.

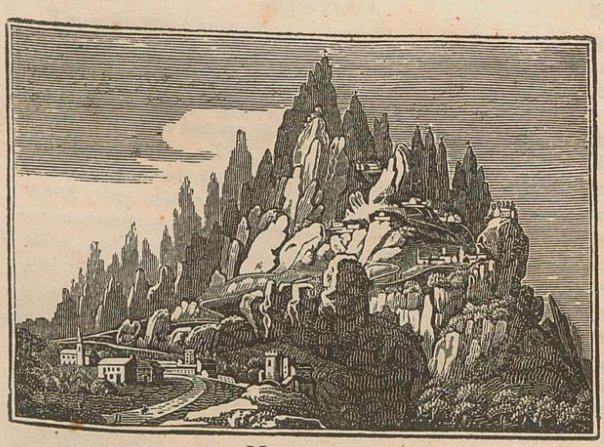
Perhaps there is not in our hemisphere a theatre more instructive, or more adapted for reflection, than the summit of this mountain. Where beside can be seen such variety and contrast of forms; such results of the efforts of time; such effects of all the climates, and of all the seasons? At one glance may be embraced frosts equally intense with those of Lapland, and the rich and delightful frontiers of Italy; eternal ice, and waving harvests; all the chilling horrors of winter, and the luxuriant vegetation of summer; eighty leagues of fertile plains, covered with towns, with vineyards, with fields and herds, and, adjoining to these, a depth of twenty thousand feet of everlasting ice.

MONTSERRAT.

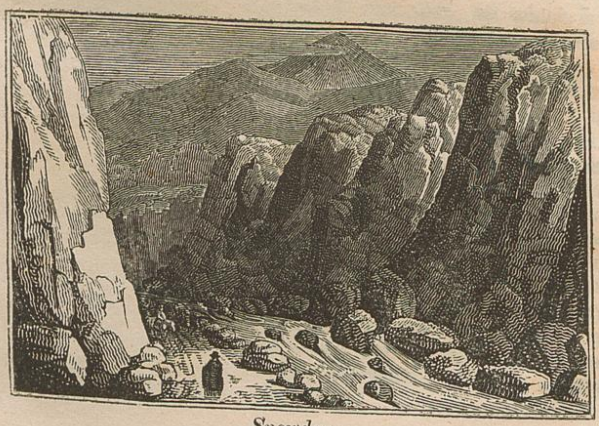
Here, 'midst the changeful scenery, ever new,
Fancy a thousand wond'rous forms descries,
More wildly great than ever pencil drew;
Rocks, torrents, gulfs, and shapes of giant size,
And glittering cliffs on cliffs, and fiery ramparts rise.

BEATTIE.

THIS Spanish mountain, which has been so long celebrated on account of the singularity of its shape, but chiefly for its convent and its numerous hermitages, is nine leagues north-west of Barcelona, in the province of Catalonia. It is in height only 3300 feet above the level of the sea, but it commands an enchanting prospect of the fine plain of Barcelona, extending to the sea, as well as of the islands of Majorca and Minorca, distant 150 miles.



Montserrat.



Snowdon.

Towards Barcelona this mountain presents a bold and rugged front; but on the west, towards Vacarisas, it is almost perpendicular, notwithstanding which, a carriage-road winds round to the convent, which is placed in a sheltered recess among the rocks, at about half the height of the mountain. The Llobregat roars at the bottom; and the rock presents perpendicular walls from the edge of the water: but above the convent, the mountain divides into two crowns or cones, which form the most prominent features; while smaller pinnacles, blanched and bare, and split into pillars, pipes, and other singular shapes, give a most picturesque effect. Here are seen fourteen or fifteen hermitages, which are scattered over different points of the mountain, some of them on the very pinnacles of the cones, to which they seem to grow, while others are placed in cavities hewn out of the loftiest pyramids. The highest accessible part of the mountain is above the hermitage of St. Maddelena, the descent from which is between two cones, by a flight of steps, called Jacob's Ladder, leading into a valley, which runs along the summit of the mountain. The cones are here in the most grotesque shapes, the southern one being named "the Organ," from its resemblance to a number of pipes.

At the extremity of this valley, which is a perfect shrubbery, and on an eminence, stands the hermitage of St. Jerome, the highest and most remote of all; and near it is the loftiest station of the whole mountain, on which is a little chapel, dedicated to the Virgin. From this elevated pinnacle the prospect is vast and splendid.

Although the elements have wreaked all their fury on these shattered peaks, yet nature has not been sparing in her gifts; the spaces between the rocks being filled up with close woods, while numerous evergreens, and other plants, serve to adorn the various chasms, rendering them valuable depositories of the vegetable kingdom. Few, indeed, are the evergreens of Europe which may not be found here; and when the mountain was visited by Mr. Swinburne, the apothecary of the convent had a list of four hundred and thirty-seven species of plants, and forty of trees, which shoot up spontaneously, and grace this hoary and venerable pile. There being two springs only on the mountain, there is a scarcity of water, which is chiefly

collected in cisterns; an inconvenience, however, which is in a great measure counterbalanced by the absence of wolves, bears, and other wild beasts.

Captain Carlton, an Englishman, who visited Montserrat some years ago, ascended to the loftiest hermitage, that of St. Jerome, by the means of spiral steps hewn out in the rock, on account of the steep acclivity. This, he observes, could not, in his time, be well accomplished by a stranger, without following the footsteps of an old ass, who carried from the convent a daily supply of food to the hermits. This animal having his two panniers stored with the provisions divided into portions, climbed without a guide, and having stopped at each of the cells, where the hermit took the portion allotted to him, returned back to the convent. He found that one of these hermits, to beguile the wearisomeness of his solitude, had contrived so effectually to tame the birds which frequented the groves surrounding his hermitage, that he could draw them together with a whistle, when they perched on his head, breast, and shoulders, taking the food from his mouth.

The Convent is situated on the eastern side of the mountain, which seems to have been split by vast torrents of water, or by some violent convulsion of nature: in this way a platform has been formed in the cleft, sufficiently ample for the purpose of its construction. It is one of the forty-five religious houses of the Spanish congregation of the order of St. Benedict. The monks are bound to supply food and lodging for three days to all pilgrims who come up to pay their homage to the Virgin; beside which, they entertain the hermits on Sundays. The latter, who make a vow never to quit the mountain, take their stations by seniority, the junior hermit being placed at the greatest distance from the convent, and descending progressively as the vacancies happen. They are not altogether idle, taking pains to rival each other in making basket-works and other fanciful productions, which they display with great affability to their visitors. They assemble every morning to hear mass and perform divine service, in the parish-church of St. Cecilia, which lies considerably above the convent; and twice a week they confess and communicate. They wear their beards long, and are clad in brown.

The church of St. Cecilia is a gloomy edifice, the gilding

of which is much sullied by the smoke of eighty-five silver lamps, of various forms and sizes, suspended round the cornice of the sanctuary. For the supply of these with oil, funds have been bequeathed by devotees. The choir is decorated with wood carvings, curiously wrought, representing the most prominent passages in the life of Christ.

THE PEAK OF TENERIFFE.

The Island of Teneriffe has received its present name from the inhabitants of the adjacent island Palma, in whose language *tener* signifies snow, and *iffe*, a hill. In extent, wealth, and fertility, it exceeds all the other Canary islands. It continues to rise on all sides from the sea, until it terminates in the celebrated Peak, which is, however, situated rather in the southern part than in the centre of the island. The ascent on the north is more gradual than at the other parts, there being a space along the shore about three leagues in breadth, bounded on the sides by high mountains, or rather cliffs; but more inland it rises like a hanging garden all the way, without any considerable interruption of hills or vallies. The form of this island is triangular, extending itself into three capes, the nearest of which is about eighty leagues from the coast of Africa. In the middle it is divided by a ridge of mountains, which have been compared to the roof of a church, the Peak forming the spire or steeple in the centre.

The elevation of the Peak of Teneriffe, according to the most accurate measurement, made by Cordier, is 12,166 feet, nearly two miles and one-third, above the level of the sea. In the ascent, the first eminence is called Monte Verde, or the green mountain, from the high fern with which it is covered, and presents a level plain of considerable extent. Beyond this, is the Mountain of Pines, which are said to have formerly grown there in great abundance; but its steep sides are now become craggy and barren, and its whole appearance very different from that of the eminence described above. After passing this summit, the traveller reaches a plain, on which the natives have bestowed the name of Mouton de Trigo, and upon which the Peak in reality stands. It is a mountainous platform, rising more

than seven thousand feet, nearly a mile and a half, above the level of the sea; and here the currents of lava, hitherto concealed by the vegetation, begin to appear in all their aridity and confusion, a few lowly shrubs and creeping plants alone diversifying the surface of a desert, the most arid and rugged that can be imagined.

A small sandy platform of pumice stones, bordered by two enormous currents of vitreous lava, and blocks of the same nature, ranged in a semicircle, forms what is called the Station of the English, on account of the Peak having been so often visited by British travellers. This platform is 9,786 feet, upwards of a mile and three quarters, above the level of the sea; and beyond it the acclivity is very steep, great masses of scoriæ, extremely rough and sharp, covering the currents of lava. Towards the summit, nothing but pumice stone is to be seen. In fact, the Peak can only be ascended on the east and south-east sides. As it is impossible to get round the crater, the traveller's progress is arrested at the spot at which he reaches it. Here the two orders of volcanic substances are to be seen, the modern lavas being thrown up amid the ruins of ejections much more ancient, the immense masses of which constitute the platform on which the Peak is placed. The shattered sides present a series of thick beds, almost all plunging towards the sea, composed alternately of ashes, volcanic sand, pumice stones, lavas, either compact or porous, and scoriæ. An incalculable number of currents, comparatively recent, which have descended from the Peak, or have issued from its flanks, form irregular furrows, which run along the more ancient masses, and lose themselves in the sea to the west and north. Among these currents more than eighty craters are scattered, and augment with their ruins the confusion which prevails throughout.

The crater can alone be reached by descending down three chasms. Its sides are absolutely precipitous within, and are most elevated towards the north. Its form is elliptical; its circumference about one thousand two hundred feet; and its depth, according to Cordier, one hundred and ten feet. Humboldt, however, estimates it at not more than from forty to sixty feet. The sides are, agreeably to the former of these observers, formed of an earth of snowy whiteness, resulting from the decomposition of the blackest

and hardest vitreous porphyritic lava. All the rest is solid, and the lowest part occupied by blocks, which have fallen down from the sides. These solid parts are covered with shining crystals of sulphur, of a rhomboidal and octoedral figure, some of which are nearly an inch high, and are, perhaps, the finest specimens of native volcanic sulphur yet known. Vapours issue in abundance from among these blocks, and from an infinity of fissures which preserve a very intense heat. These vapours consist solely of sulphur and water, perfectly insipid. Beside the incrustations of sulphur, opal, in thin plates, is formed with great celerity. Humboldt regards the Peak of Teneriffe as an enormous basaltic mountain, resting upon a dense secondary calcareous stone.

Various travellers have asserted, that the cold is intensely keen on the summit of the Peak; that respiration is difficult; and that, particularly, spirituous liquors lose all their strength; which latter circumstance they ascribe to the spirit being more or less exposed to the sulphureous fumes exhaled from the crater. Cordier, and several other accurate observers, declare, however, that neither the smell nor the strength of liquids appeared, at this elevation, to be in the least degree impaired; and that volatile alkali, ether, and spirit of wine, possessed their usual pungency. They add, that the cold is very supportable; and that neither the aqueous sulphureous vapours, nor the rarity of the air, render breathing difficult.

We extract the following interesting particulars from Humboldt's account of his visit to Teneriffe.

"Towards three in the morning, by the sombrous light of a few fir torches, we began our expedition for the summit of the Piton. We scaled the volcano on the north-east, where the declivities are extremely steep; and came, after two hours' toil, to a small plain, which, on account of its isolated situation, bears the name of Alta Vista. It is the station also of the Neveros—those natives, whose occupation it is to collect ice and snow, which they sell in the neighbouring towns. Their mules, better practised in climbing mountains than those hired by travellers, reach Alta Vista, and the Neveros are obliged to transport the snow to this place on their backs. Above this point the Malpays begins; a term by which is designated here, as

well as in Mexico, Peru, and every other country subject to volcanoes, a ground destitute of vegetable mould, and covered with fragments of lavas.

"We observed, during the twilight, a phenomenon which is not unusual on high mountains, but which the position of the volcano we were scaling, rendered very striking. A layer of white and fleecy clouds concealed from us the sight of the ocean, and the lower region of the island. This layer did not appear above one thousand six hundred yards high; the clouds were so uniformly spread, and kept so perfect a level, that they wore the appearance of a vast plain covered with snow. The colossal pyramid of the Peak, the volcanic summits of Lanzerota, of Fortaventura, and the isle of Palma, were like rocks amidst this vast sea of vapours, and their black tints were in fine contrast with the whiteness of the clouds."

By an astronomical observation, made at the above elevation at sun-rise, it was ascertained that the true horizon, that is, a part of the sea, was distant one hundred and thirty miles. Our traveller proceeds thus:

"We had yet to scale the steepest part of the mountain, the Piton, which forms the summit. The slope of this small cone, covered with volcanic ashes, and fragments of pumice stone, is so steep, that it would have been almost impossible to reach the top, had we not ascended by an old current of lava, the wrecks of which have resisted the ravages of time. These wrecks form a wall of scorious rocks, which stretches itself into the midst of the loose ashes. We ascended the Piton by grasping these half decomposed scoriæ, the sharp edges of which remained often in our hands. We employed nearly half an hour to scale a hill, the perpendicular height of which does not exceed five hundred feet.

"When we gained the summit of the Piton, we were surprised to find scarcely room enough to seat ourselves conveniently. The west wind blew with such violence that we could scarcely stand. It was eight in the morning, and we were frozen with the cold, though the thermometer kept a little above the freezing point.

"The wall, which surrounds the crater like a parapet, is so high, that it would be impossible to reach the Caldera, if on the eastern side there were not a breach, which seems

to have been the effect of a flowing of very old lava. We descended through this breach towards the bottom of the tunnel, the figure of which is elliptical. The greatest breadth of the mouth appeared to us to be three hundred feet, the smallest two hundred feet.

"We descended to the bottom of the crater on a train of broken lava, from the eastern breach of the enclosure. The heat was perceptible only in a few crevices, which gave vent to aqueous vapours, with a peculiar buzzing noise. Some of these funnels or crevices are on the outside of the enclosure, on the external brink of the parapet that surrounds the crater. We plunged the thermometer into them, and saw it rise rapidly to sixty-eight and seventy-five degrees.

"We prolonged in vain our stay on the summit of the Peak, to wait the moment when we might enjoy the view of the whole of the Archipelago of the Fortunate Islands. We discovered Palma, Gomera, and the Great Canary, at our feet. The mountains of Lanzerota, free from vapours at sun-rise, were soon enveloped in thick clouds. On a supposition only of an ordinary refraction, the eye takes in, in calm weather, from the summit of the volcano, a surface of the globe of five thousand seven hundred square leagues, equal to a fourth of the surface of Spain.

"Notwithstanding the heat we felt in our feet on the edge of the crater, the cone of ashes remains covered with snow during several months in the winter. It is probable, that under the cap of snow considerable hollows are found, like those we find under the glaciers of Switzerland, the temperature of which is constantly less elevated than that of the soil on which they repose. The cold and violent wind which blew from the time of sun-rise, engaged us to seek shelter at the foot of the Piton. Our hands and faces were frozen, while our boots were burnt by the soil on which we walked. We descended in the space of a few minutes the Sugar-Loaf, which we had scaled with so much toil; and this rapidity was in part involuntary, for we often rolled down on the ashes. It was with regret that we quitted this solitary place, this domain where nature towers in all her majesty."

To the above we subjoin the following extract from the account published in the first volume of the Transactions of the Geological Society, by the Hon. Mr. Bennet.

At the distance of thirty-four leagues from the island, Mr. Bennet had a very distinct view of the Peak, rising like a cone from the bed of the ocean. The rocks and strata of Teneriffe, he observes, are wholly volcanic, the long chain of mountains, which may be termed the central chain, traversing the island from the foot of the second region of the Peak, and sloping down on the eastern, western, and northern sides, to the sea. Towards the south, or more properly the S. S. W. the mountains are nearly perpendicular, and though broken into ridges, and occasionally separated by deep ravines, that are cut transversely as well as longitudinally, there are none of those plains, nor that gradual declination of strata, which the south-eastern and north-western sides of the island exhibit.

Mr. Bennet ascended the Peak in the month of September, 1810. We give the abridged details of this expedition in his own words.

The road to the city of Orotava, is a gradual and easy slope for three or four miles, through a highly cultivated country. Leaving the town, after a steep ascent of about an hour, through a deep ravine, we quitted the cultivated part, and entered into forests of chesnuts, the trees of which are of a large size. The form of this forest is oblong; the soil is deep, and formed of decomposed lava, small ash, and pumice. I examined several channels in the strata, or ravines worn by the rains, and there was no appearance of any other rock. Leaving this forest, the tract passes over a series of green hills, which we traversed in about two hours, and at last halted to water our mules at a spot where there is a small spring of bad and brackish water issuing from a lava rock. The ravine is of considerable depth. The range of green hills extends a mile or two further, the soil shallowing by degrees, until at length, the trees and shrubs gradually dwindling in size, the Spanish broom alone covers the ground. Leaving behind us this range of green hills, the track, still ascending, leads for several hours across a steep and difficult mass of lava rock, broken here and there into strange and fantastic forms, worn into deep ravines, and scantily covered in places by a thin layer of yellow pumice. As we proceeded on our road, the hills on our left gradually rose in height till the summits were lost in those of the central chain; while, on our right,

we were rapidly gaining an elevation above the lower range of the Peak. We met with several small conical hills, or mouths of extinct volcanoes, the decomposed lava on the edges of the craters having a strong red ochreous tint. At length, an immense undulated plain spreads itself like a fan, on all sides, nearly as far as the eye can reach. This plain is bounded on the west south-west, and south south-west, by the regions of the Peak; and on the east and north-east, by a range of steep perpendicular precipices and mountains, many leagues in circumference, called by the Spaniards *Las Faldas*. On this plain, or desert, for we had long left all show of vegetation, exeept a few stunted plants of Spanish broom, a sensible change was felt in the atmosphere: the wind was keen and sharp, and the climate like that of England in the months of Autumn. All here was sad, silent, and solitary. We saw at a distance the fertile plains on the coast, lying as it were under our feet, and affording a cheerful contrast to the scenes of desolation with which we were surrounded; we were already seven or eight thousand feet above the level of the sea, and had reached the bottom of the second region of the Peak.

Having reached the end of the plain, we found ourselves at the bottom of a steep hill, at the foot of which is a mass or current of lava. After a laborious, not to say hazardous, ascent of about an hour, the pumice and ash giving way, and the mules sinking knee deep at each step, we arrived at about five in the afternoon at the other extremity of the stream of lava, which, descending from the summit of the second region of the peak, divides at the foot of the cone into two branches, the one running to the north-east, and the other to the north-west. It was here we were to pass the night; so, lighting a fire made of dry branches of the Spanish broom, and stretching part of a sail over a portion of the rock, we ate our dinner and laid ourselves down to sleep. I however passed the best part of the night by the fire, the weather being piercingly cold. As I stood by the fire, the view all around me was wild and terrific, the moon rose about ten at night, and, though in her third quarter, gave sufficient light to shew the waste and wilderness by which we were surrounded. The Peak and the upper regions which we had yet to ascend, towered awfully above our heads, while, below, the mountains that had appeared of

such a height in the morning, and had cost us a day's labour to climb, lay stretched as plains at our feet; from the uncommon rarity of the atmosphere, the whole vault of heaven appeared studded with innumerable stars, while the valleys of Orotava were hidden from our view by a thin veil of light fleecy clouds, that floated far beneath the elevated spot we had chosen for our resting-place; the solemn stillness of the night was only interrupted by the crackling of the fire round which we stood, and by the whistling of the wind, which, coming in hollow gusts from the mountain, resembled the roar of distant cannon.

Between two and three in the morning we resumed, on foot, our ascent of the mountain, the lower part of which we had climbed on horseback the preceding evening; the ascent, however, became much more rapid and difficult, our feet sinking deep in the ashes at every step. From the uncommon sharpness of the acclivity, we were obliged to stop often to take breath; after several halts, we at last reached the head of the pumice hill. After resting some short time here, we began to climb the stream of lava, stepping from mass to mass. The ascent is steep, painful, and hazardous; in some places the stream of lava is heaped up in dykes or embankments; and we were often obliged to clamber over them as one ascends a steep wall.

We halted several times during the ascent, and at last reached a spot called La Cueva, one of the numerous caves that are found on the sides of the mountain; this is the largest of them, and is filled with snow and the most delicious water, which was just at the point of congelation. The descent into it is difficult, it being thirty or forty feet deep. One of our party let himself down by a rope: he could not see the extent of the cave, but the guides declared it to be three hundred feet in length, and to contain thirty or forty feet of water in depth. The roof and sides are composed of a fine stalactitic lava, similar to that found on Vesuvius, and it is of the same nature as that which flowed on the surface. We rested here about half an hour, during which we had an opportunity of observing the rising of the sun, and that singular and rapid change of night into day, the consequence of an almost entire absence of twilight. As we ascended the north-east side of the mountain, this view was strikingly beautiful; at

first there appeared a bright streak of red on the horizon, which gradually spread itself, lighting up the heavens by degrees. and growing brighter and brighter, till at last the sun burst forth from the bed of the ocean, gilding, as it rose, the mountains of Teneriffe, and those of the great Canary; in a short time the whole country to the eastward lay spread out as a map. The great Canary was easily to be distinguished; and its rugged and mountainous character, similar to that of the other islands, became visible to the naked eye. The cold at this time was intense, the wind keen and strong, and the thermometer sunk to 32 degrees. After a short though rapid ascent, we reached the summit of the second stage of the mountain, passing over a small plain of white pumice, on which were spread masses of lava, and at length arrived at the foot of the cone. This division of the mountain forms what is generally termed the *Peak of Teneriffe:* it represents the present crater of Vesuvius, with this difference, however, that, while the surface of that mountain is composed of a black cinder or ash, the superficies of this appears to be a deposit of pumice of a white colour, of scoria and lava, with here and there considerable masses that were probably thrown out when the volcano was in action. Numerous small cavities on the side of the mountain emitted vapour with considerable heat. Here begins the only fatiguing part of the ascent; the steepness of the cone is excessive; at each step our feet sunk into the ash, and large masses of pumice and lava rolled down from above; we were all bruised, and our feet and legs were cut, but none materially hurt: at last we surmounted all difficulties, and seated ourselves on the highest ridge of the mountain. This uppermost region does not appear to contain in superficies more than an acre and a half, and is itself a small crater, the walls of which are the different points on which we sat, and are plainly visible from below. Within, the lava is in the most rapid state of decomposition. The surface is hot to the feet, and the guides said it was dangerous to remain long in one spot; as it was, some of us sunk to our knees in the hot deposit of sulphur; upon striking the ground with the feet, the sound is hollow, similar to what is produced by the same impulsion on the craters of *Vesuvius*, and *Solfaterra*. I estimate the depth of the crater to be, from the highest

ridge to the bottom, about two hundred feet, forming an easy and gradual descent.

The view from the summit is stupendous: we could plainly discover the whole form of the island, and we made out distinctly three or four of the islands, which, collectively, are called the Canaries; we could not, however, see *Lancerotte* or *Fuerteventura*, though we were told that other travellers had distinguished them all.

From this spot, the central chain of mountains that runs from south-west to north-east, is easily to be distinguished. These, with the succession of fertile and woody vallies, commencing from *San Ursula*, and ending at Las Horcas, with the long line of precipitous lava rocks that lay on the right of our ascent, and which traverse that part of the island running from east to west, from their point of departure at the *Canales* to where they end in an abrupt headland on the coast, with their forests, and villages, and vineyards, the port with the shipping in the roads, the towns of Orotava with their spires glittering as the morning sun burst upon them, afford a cheerful contrast to the streams of lava, the mounds of ash and pumice, and the sulphurated rock on which we had taken our seat. The sensation of extreme height was in fact one of the most extraordinary I ever felt; and though I did not find the pain in my chest, arising from the rarity of the atmosphere, near so acute as on the mountains of Switzerland, yet there was a keenness in the air, independent of the cold, that created no small uneasiness in the lungs. The respiration became short and quick, and repeated halts were found necessary. The idea also of extreme height was to me more determinate and precise than on the mountains of Switzerland; and though the immediate objects of vision were not so numerous, yet as the ascent is more rapid, the declivity sharper, and there is here no mountain like Mont Blanc towering above you, the 12,000 feet above the level of the sea appeared considerably more than a similar elevation above the lake of Geneva. We remained at the summit about three quarters of an hour, our ascent having cost us a labour of four hours, as we left the Estancia at ten minutes before three, and reached the top of the peak before seven. Our thermometer, which was graduated to the scale of Fahrenheit, was, during our ascent, as follows:

at Orotava, at eight in the morning, 74°; at six in the evening, at La Estancia, 50°; at one, in the following morning, 42°; at La Cueva, at half past four, 32°; at the bottom of the cone, 36°; at the top of the peak, one hour and a half after sun-rise, 33°. The descent down the cone is difficult from its extreme rapidity, and from the fall of large stones, which loosen themselves from the beds of pumice. Having at last scrambled to the bottom, we pursued our march down the other course of the lava, that is to say, down its westerly side, having ascended its eastern. The ravines and rents in this stream of lava are deep and formidable; the descent into them is always painful and troublesome, often dangerous: in some places we let ourselves down from rock to rock. I can form no opinion why there should be these strange irregularities in the surface of this lava; in places it resembles what sailors term the trough of the sea, and I can compare it to nothing but as if the sea in a storm had by some force become on a sudden stationary, the waves retaining their swell. As we again approached *La Cueva*, we came to a singular steep valley, the depth of which, from its two sides, cannot be less than one hundred to one hundred and fifty feet, the lava lying in broken ridges one upon the other, similar to the masses of granite rock that time and decay have tumbled down from the top of the Alps; and, except from the scoria, or what Milton calls "the Fiery Surge," they in no degree bear the marks of having rolled as a stream of liquid matter.

We descended the pumice hill with great rapidity almost at a run, and arrived at La Estancia in little more than two hours. We then mounted our mules, and following the track by which we had ascended the preceding day, we reached, about four o'clock, the country-house of our hospitable friend Mr. Barry.

The first eruption of which there is any distinct account, occurred on the 24th of December, 1704, when twenty-nine shocks of an earthquake were distinctly felt. On the 31st a great light was observed on Manja, towards the white mountains. Here the earth opened, and two volcanoes were formed, which threw up such heaps of stones as to raise two considerable mountains: the combustible matter, which still continued to be thrown up, kindled above fifty

fires in the vicinity. The whole country for three leagues round was in flames, which were increased by another volcano opening by at least thirty different vents within the circumference of half a mile. On the 2nd of February following, another volcano broke out in the town of Guimar, swallowing up a large church.

A subsequent eruption in 1706 filled up the port of Guarachico. The lava, in its descent, ran five leagues in six hours; and on this lava houses are now built where ships formerly rode at anchor. Neither of these eruptions were from the crater on the summit of the peak, for that has not ejected lava for centuries, and it now issues from the flanks only. The last eruption was on the 9th of June, 1798, and was very terrible. Three new mouths opened at the height of 8,130 feet, upwards of a mile and a half above the level of the sea, upon the inclined slope of the base of the Peak towards the S. W. Above this, at the height of 10,240 feet, nearly two miles, M. Cordier found a vast crater nearly four miles and a half in circumference, which he ascertained to be very ancient. Its sides are extremely steep, and it still presents the most frightful picture of the violence of subterraneous fire. The Peak rises from the sides of this monstrous aperture. To the S. W. is the mountain of Cahorra, which is said to have become a volcano in 1797. The other mountains of Teneriffe, which tradition reports to have been formerly volcanoes, are Monte Roxo, or the red mountain; several mountains, called the Malpasses, lying to the eastward; and one, in a southern direction, named Rejada. Throughout the whole of the distance between Monte Roxo and the bay of Adexe, according to Mr. Glass, the shore is about 2500 feet, nearly half a mile, in height, and perpendicular as a wall. The southern coast has a much superior elevation, the chain of mountains by which it is bounded being, agreeably to St Vincent, 8,320 feet, more than a mile and a half, above the level of the sea.

THE SOUFFRIERE MOUNTAIN,

IN THE ISLAND OF ST. VINCENT.

This volcanic mountain, the dreadful eruption of which we are about to describe, is the most elevated and most

northerly of the lofty chain running through the West-India island of St. Vincent. From the extraordinary frequency and violence of the earthquakes, which, in 1811, are calculated to have exceeded two hundred, some great movement or eruption was looked for. In the interim the mountain indicated much disquietude; but the apprehension was not so immediate as to restrain curiosity, or to prevent repeated visits to the crater, which had latterly been more numerous than ever. Even on the 26th of April, 1812, the day preceding the eruption, several gentlemen ascended and remained there for some time. Nothing unusual was then remarked, nor any external difference observed, except rather a stronger emission of smoke from the interstices of the conical hill, at the bottom of the crater. To those who have not visited this romantic and wonderful spot, a slight description of it, as it lately stood, is previously necessary.

"About 2000 feet from the level of the sea, on the south side of the mountain, and at rather more than two-thirds of its height, opens a circular chasm, somewhat exceeding half a mile in diameter, and between 400 and 500 feet in depth. Exactly in the centre of this capacious bowl, rose a conical hill about 260 or 300 feet in height, and about 200 in diameter, richly covered and variegated with shrubs, brushwood, and vines, above half way up, and the remainder covered over with virgin sulphur to the top. From the fissures of the cone and interstices of the rocks, a thin white smoke was constantly emitted, occasionally tinged with a slight bluish flame. The precipitous sides of this magnificent amphitheatre were fringed with various evergreens and aromatic shrubs, flowers, and many alpine plants. On the north and south sides of the base of the cone were two pieces of water, one perfectly pure and tasteless, the other strongly impregnated with sulphur and alum. This lonely and beautiful spot was rendered more enchanting by the singularly melodious notes of a bird, an inhabitant of these upper solitudes, and altogether unknown to the other parts of the island—hence principally called or supposed to be invisible, though it certainly has been seen, and is a species of blackbird.

A century had now elapsed since the last convulsion of the mountain, or since any other elements had disturbed the serenity of this wilderness, beside those which are common

to the tropical tempest. It apparently slumbered in primeval solitude and tranquillity, and, from the luxuriant vegetation and growth of the forest, which covered its side from the base nearly to the summit, seemed to discountenance the fact, and falsify the records of the ancient volcano. Such was the majestic, peaceful Souffriere, on April the 27th; but our imaginary safety was soon to be confounded by the sudden danger of devastation. Just as the plantation bells rang at noon on that day, an abrupt and dreadful crash from the mountain, with a severe concussion of the earth, and tremulous noise in the air, alarmed all around it. The resurrection of this fiery furnace was proclaimed in a moment by a vast column of thick, black, ropy smoke, like that of an immense glass-house, bursting forth at once, and mounting to the sky; showering down sand, with gritty calcined particles of earth and ashes mixed, on all below. This, driven before the wind towards Wallibou and Morne Ronde, darkened the air like a cataract of rain, and covered the ridges, woods, and cane-pieces with light grey-coloured ashes, resembling snow when slightly covered by dust. As the eruption increased, this continual shower expanded, destroying every appearance of vegetation. At night a very considerable degree of ignition was observed on the lips of the crater; but it is not asserted that there was as yet any visible ascension of flame. The same awful scene presented itself on the following day; the fall of ashes and calcined pebbles still increasing, and the compact, pitchy column from the crater rising perpendicularly to an immense height, with a noise at intervals like the muttering of distant thunder.

On Wednesday, the 29th, all these menacing symptoms of horror and combustion still gathered more thick and terrific for miles around the dismal and half-observed mountain. The prodigious column shot up with quicker motion, dilating as it rose like a balloon. The sun appeared in total eclipse, and shed a meridian twilight over us, that aggravated the wintry gloom of the scene, now completely powdered over with falling particles. It was evident that the crisis was yet to come—that the burning fluid was struggling for a vent, and labouring to throw off the superincumbent strata and obstructions, which suppressed its torrent. At night, it was manifest that it had greatly disengaged itself from its

burthen, by the appearance of fire flashing above the mouth of the crater.

On the memorable 30th of April, the reflection of the rising sun on this majestic body of curling vapour was sublime beyond imagination:—any comparison of the Glaciers, or of the Andes, can but feebly convey an idea of the fleecy whiteness and brilliancy of this awful column of intermingled and wreathed smoke and clouds. It afterwards assumed a more sulphureous cast, like what are called thunder-clouds, and in the course of the day had a ferruginous and sanguine appearance, with a much livelier action in the ascent, and a more extensive dilatation, as if almost freed from every obstruction. In the afternoon, the noise was incessant, and resembled the approach of thunder still nearer and nearer, with a vibration that affected the feelings and hearing: as yet there was no convulsive motion, or sensible earthquake. The Charaibs settled at Morne Ronde, at the foot of the Souffriere, abandoned their houses, with their live stock, and every thing they possessed, and fled precipitately towards town. The negroes became confused, forsook their work, looked up to the mountain, and, as it shook, trembled, with the dread of what they could neither understand nor describe—the birds fell to the ground, overpowered with showers of ashes, unable to keep themselves on the wing---the cattle were starving for want of food, as not a blade of grass or a leaf was now to be found---the sea was much discoloured, but not uncommonly agitated; and it is remarkable, that throughout the whole of this violent disturbance of the earth, it continued quite passive, and did not at any time sympathise with the agitation of the land. About four o'clock in the afternoon, the noise became more alarming, and just before sun-set the clouds reflected a bright copper colour, suffused with fire. Scarcely had the day closed, when the flames burst at length pyramidically from the crater, through the mass of smoke; the rolling of the thunder became more awful and deafening; electric flashes quickly succeeded, attended with loud claps; and now, indeed, the tumult began. Those only who have witnessed such a sight, can form any idea of the magnificence and variety of the lightning and electric flashes; some forked and zig-zag, playing across the perpendicular column from the crater—

others shooting upwards from the mouth like rockets of the most dazzling lustre—others like shells, with their trailing fuses, flying in different parabolas, with the most vivid scintillations from the dark sanguine column, which now seemed inflexible, and immoveable by the wind. Shortly after seven in the afternoon, the mighty caldron was seen to simmer, and the ebullition of lava to break out on the N. W. side. This, immediately after boiling over the orifice, and flowing a short way, was opposed by the acclivity of a higher point of land, over which it was impelled by the immense tide of liquified fire that drove it on, forming the figure V in grand illumination. Sometimes, when the ebullition slackened, or was insufficient to urge it over the obstructing hill, it recoiled like a refluent billow, from the rock, and then again rushed forward, impelled by fresh supplies, and, surmounting every obstacle, carried rocks and woods together, in its course down the slope of the mountain, until it precipitated itself down some vast ravine, concealed from our sight by the intervening ridges of Morne Ronde. Vast globular bodies of fire were seen projected from the fiery furnace, and, bursting, fell back into it, or over it, on the surrounding bushes, which were instantly set in flames. About four hours from the lava boiling over the crater, it reached the sea, as we could observe from the reflection of the fire and electric flashes attending it. About half past one, the following morning, another stream of lava was seen descending to the eastward towards Rabacca. The thundering noise of the mountain, and the vibration of sound that had been so formidable hitherto, now mingled in the sudden monotonous roar of the rolling lava, became so terrible, that dismay was almost turned into despair. At this time the first earthquake was felt; this was followed by showers of cinders, which fell with the hissing noise of hail, during two hours.

"At three o'clock, a rolling on the roofs of the houses indicated a fall of stones, which soon thickened, and at length descended in a rain of intermingled fire, which threatened at once the fate of Pompeii, or Herculaneum. The crackling coruscations from the crater at this period exceeded all that had yet passed. The eyes were struck with momentary blindness, and the ears stunned with a confusion of sounds. People sought shelter in the cellars, under rocks,

or any where—for every place was nearly the same; and the miserable negroes, flying from their huts, were knocked down, or wounded, and many killed in the open air. Several houses were set on fire. The estates situated in the immediate vicinity seemed doomed to destruction. Had the stones which fell been heavy in proportion to their size, not a living creature could have escaped death: these, having undergone a thorough fusion, were divested of their natural gravity, and fell almost as light as pumice, though in some places as large as a man's head. This dreadful rain of stones and fire lasted upwards of an hour, and was again succeeded by cinders from three till six o'clock in the morning. Earthquake followed earthquake, almost momentarily; or rather the whole of this part of the island was in a state of continued oscillation; not agitated by shocks, vertical or horizontal; but undulated like water shaken in a bowl.

The break of day, if such it could be called, was truly terrific. Utter darkness prevailed till eight o'clock, and the birth of May dawned like the day of judgment: a chaotic gloom enveloped the mountain, and an impenetrable haze hung over the sea, with black sluggish clouds of a sulphureous cast. The whole island was covered with cinders, scoriæ, and broken masses of volcanic matter. It was not until the afternoon, that the muttering noise of the mountains sunk gradually into a solemn yet suspicious silence. Such are the particulars of this sublime and tremendous scene, from its commencement to its catastrophe.

THE PEAK OF DERBYSHIRE.

This Peak consists of a chain of high mountains in the County of Derby, and has been long celebrated, as well on account of its mineral productions, and natural curiosities in general, as of what are called its seven wonders. Six of these are natural, namely, Poole's Hole, Elden Hole, the Peak Cavern, or the Devil's Hole, Mamtor, St. Ann's Well, and the Ebbing and Flowing Well. Having described these, we shall add a recent discovery, that of the Crystallized Cavern, which possesses an equal interest.

Poole's Hole lying about a mile to the westward of

Buxton, is a vast cavern formed by nature in the limestone rock, and was, according to tradition, the residence of an out-law, named Poole. The entrance is low and contracted, and the passage narrow; but this widening, at length, leads to a lofty and spacious cavern, from the roof of which stalactites or transparent crystals, formed by the constant dropping of water laden with calcareous matter, hang in spiral masses. Other portions of these petrifactions drop and attach themselves to the floor, rising in cones, and becoming what are termed *stalagmites*.

One of the dropping stalactites, of an immense size, called the *flitch of bacon*, occurs about the middle of the cavern, which here becomes very narrow, but soon spreads to a greater width, and continues large and lofty until the visitor reaches another surprisingly large mass of stalactite, to which the name of *Mary Queen of Scots' Pillar* is given, from the tradition of that unfortunate queen having paid a visit to the cavern, and proceeded thus far into its recesses. As this pillar cannot be passed without some difficulty, few persons venture beyond it; nor does it seem desirable, as, by proceeding thus far, a very competent idea of the cavern may be formed. The path hitherto is along the side, and at some height from the bottom of the cavern; but to visit and examine the interior extremity, it becomes necessary to descend a few yards by very slippery and ill-formed steps. The path at the bottom is tolerably even and level for about sixty feet, when an almost perpendicular ascent commences, which leads to the extremity of the fissure, through the *eye of St. Anthony's needle*; a narrow strait, beyond which the steepness of the way is only to be surmounted by clambering over irregular masses of rock. The cavern terminates at nearly three hundred feet beyond the Queen of Scots' pillar. Towards the end is an aperture through a projecting rock, behind which a candle is generally placed, when any person has reached the extremity: when seen at that distance, it appears like a dim star. The visitor returns along the bottom of the cavern, beneath considerable portion of the road by which he entered; and, by thus changing the path, has an opportunity better to ascertain the height and width of the cavern in every part, and to view other accumulated petrifactions, some of which are of a prodigious size, and of an extraordinary form. In

one part of this passage is a fine spring of transparent water; and a small stream, which becomes more considerable in rainy seasons, runs through the whole length of the cavern. Its sound, in passing through this spacious and lofty concavity, which resembles the interior of a Gothic cathedral, has a fine effect. To the right, in a small cavern called Poole's chamber, is a curious echo.

The various masses of stalactical matter which are every where met with in this natural excavation, and which reflect innumerable rays from the lights carried by the guides, are distinguished by the names of the objects they are fancied most to resemble. Thus we have *Poole's saddle*, his *turtle*, and his *woolsack*; the *lion*, the *lady's toilet*, the *pillion*, the *bee-hive*, &c. It should be noticed, however, that the forms are constantly varied by the percolation of the water through the roof and sides of the rock. The subterraneous passage is nearly half a mile in length.

ELDEN HOLE.

Elden Hole is situated on the side of a gentle hill about a mile to the north-west of the village of Peak Forest. It is a deep chasm in the ground, surrounded by a wall of uncemented stones, to prevent accidents. This fissure or cleft in the rock has been the subject of many exaggerated descriptions and superstitious reports, having been represented not only as unfathomable, but as teeming, at a certain depth, with so impure an air, that it could not be respired without immediate destruction. Mr. Lloyd, however, who descended into it about fifty years ago, has proved the absurdity of these relations, in a paper, of which the following is a brief abstract, published in the Philosophical Transactions.

For the first sixty feet, he observes, he descended somewhat obliquely, the passage then becoming difficult from projecting crags. At the further depth of thirty feet, the inflection of his rope varied at least eighteen feet from the perpendicular. The breadth of the chink was here about nine feet, and the length eighteen; the sides being irregular moss-grown, and wet. Within forty-two feet of the bottom, the rock opened on the east, and he swung till he reached the floor of a cave, one hundred and eighty-six feet only from the mouth, the light from which was suffi-

ciently strong to permit the reading of any book. The interior of the chasm he describes as consisting of two parts, which communicate with each other by a small arched passage, the one resembling an oven, the other the dome of a glass-house. On the south side of the latter, was a small opening, about twelve feet in length, and four in height, lined throughout with a kind of sparkling stalactite, of a fine deep yellow colour, with petrifying drops hanging from the roof. Tracing the entrance he found a noble column, above ninety feet high, of the same kind of incrustation. As he proceeded to the north, he came to a large stone which was covered with the same substance; and beneath it he found a hole six feet in depth, uniformly lined with it. From the edge of this hole sprung up a rocky ascent, sloping, like a buttress, against the side of the cavern, and consisting of vast, solid, round masses of the same substance and colour. Having climbed this ascent to the height of about sixty feet he obtained some fine pieces of stalactite, which hung from the craggy sides of the cavern. Descending with some difficulty and danger, he proceeded in the same direction, and soon came to another pile of incrustations of a brown colour, above which he found a small cavern, opening into the side of the vault, which he now entered. Here he saw vast masses of stalactite, hanging like icicles from every part of the roof: several of these were four and five feet long, and as thick as a man's body. The sides of the largest cavern were chiefly lined with incrustations of three kinds, the first of which was a deep yellow stalactite; the second, a thin coating which resembled a pale stone-colour varnish, and reflected the light of the candle with great splendour; and the third, a rough efflorescence, the shoot of which resembled a rose flower.

The authors of a recent publication thus state the result of their observations and inquiries relative to Elden Hole. They describe the mouth of this chasm as opening horizontally, in a direction from north to south; its shape being nearly that of an irregular ellipsis, about ninety feet in length, and twenty-seven in breadth at the widest part. The northern end is fringed with small trees; and moss and underwood grow out of the crevices on each side, to the depth of forty or fifty feet. As the fissure recedes from the surface, it gradually contracts; and at the depth of

about seventy feet inclines considerably to the west, so as to prevent its course from being further traced. Notwithstanding the obstacles of the bushes and projecting masses of stone, it was sounded, and its depth found not to exceed two hundred and two feet—an estimate which corresponds with the assertion of three miners, who had descended in search of the bodies of individuals who were missing, and were supposed to have been robbed, murdered, and thrown into this frightful abyss.

PEAK CAVERN.

PEAK CAVERN, also called the *Devil's* Hole, is one of those magnificent, sublime, and extraordinary productions of nature, which constantly excite the wonder and admiration of their beholders. It has accordingly been considered as one of the principal wonders of Derbyshire, and has been celebrated by several poets. It lies in the vicinity of Castleton, and is approached by a path at the side of a clear rivulet, leading to the fissure, or separation of the rock, at the extremity of which the cavern is situated. It would be difficult to imagine a scene more august than that which presents itself to the visitor at its entrance; on each side, the huge grey rocks rise almost perpendicularly, to the height of nearly three hundred feet, or about seven times the height of a modern house, and, meeting each other at right or cross angles, form a deep and gloomy recess. In front, it is overhung by a vast canopy of rock, assuming the appearance of a depressed arch, and extending, in width, one hundred and twenty feet; in height, forty-two; and in receding depth, about ninety. After penetrating about ninety feet into the cavern, the roof becomes lower, and a gentle descent leads, by a detached rock, to the interior entrance of this tremendous hollow. Here the light of day, having gradually diminished, wholly disappears; and the visitor is provided with a torch to illume his further progress.

The passage now becoming extremely confined, he is obliged to proceed, in a stooping posture, about twenty yards, when he reaches a spacious opening, named the Bell-house, and is thence led to a small lake, called the *First Water*, about forty feet in length, but not more than two or three feet in depth. Over this he is conveyed in a boat to the in-

terior of the cavern, beneath a massive vault of rock, which in some parts descends to within eighteen or twenty inches of the water. "We stood some time," says M. de St. Fond, "on the brink of this lake; and the light of our dismal torches, which emitted a black smoke, reflecting our pale images from its bottom, we almost conceived that we saw a troop of spectres starting from an abyss to welcome us. The illusion was extremely striking."

On landing, the visitor enters a spacious vacuity, 220 feet in length, 200 feet in breadth, and in some parts 120 feet in height, opening into the bosom of the rock; but, from the want of light, neither the distant sides, nor the roof of this abyss, can be seen. In a passage at the inner extremity of this vast cave, the stream which flows through the whole length of the cavern, spreads into what is called the *Second Water*, and near its termination is a projecting pile of rocks, known by the appellation of *Roger Rain's* House, from the incessant fall of water in large drops through the crevices of the roofs. Beyond this, opens another tremendous hollow, called the *Chancel*, where the rocks are much broken, and the sides covered with stalactical or petrified incrustations. Here the visitor is surprised by a vocal concert which bursts in discordant tones from the upper regions of the chasm. "Still," observes a modern tourist, "this being unexpected, and issuing from a quarter where no object can be seen, in a place where all is still as death, is calculated to impress the imagination with solemn ideas, and can seldom be heard without that mingled emotion of awe and pleasure, astonishment and delight, which is one of the most interesting feelings of the mind." At the conclusion of the strain, the choristers, who consist of eight or ten women and children, are seen ranged in the hollow of the rock, about fifty feet above the floor.

The path now leads to a place whimsically called the *Devil's Cellar* and *Half-way House*, and thence, by three natural and regular arches, to a vast concavity, which, from its uniform bell-like appearance, is called *Great Tom of Lincoln*. When illumined by a strong light, this concavity has a very pleasing effect; the symmetrical disposition of the rocks, the stream flowing beneath, and the spiracles in the roof, forming a very interesting picture. From this

point the vault gradually descends, the passage contracts, and at length does not leave more than sufficient room for the current of the stream, which continues to flow through a subterraneous channel of several miles in extent, as is proved by the small stones brought into it, after great rains, from the distant mines of the Peak Forest.

The entire length of this wonderful cavern is 2250 feet, nearly half a mile; and its depth, from the surface of the Peak mountain, about 620 feet. A curious effect is produced by the explosion of a small quantity of gunpowder, wedged into the rock in the interior of the cavern; for the sound appears to roll along the roof and sides, like a tremendous and continued peal of thunder. The effect of the light, on returning from these dark recesses, is particularly impressive; and the gradual illumination of the rocks, which become brighter as the entrance is approached, is said to exhibit one of the most interesting scenes that ever employed the pencil of an artist, or fixed the admiration of a spectator.

MAM TOR.

Mam Tor, or the Shivering Mountain, is a huge precipice facing the east or south-east, chiefly composed of a peculiar kind of slate, which, although very hard before it is exposed to the air, very easily crumbles to dust on such exposure. Hence it is perpetually wasted by the action of the rain and snow; while the harder and larger masses of stone, being thus loosened and disengaged, necessarily fall from their positions, and this with a rushing noise which is occasionally so loud as to be heard at Castleton, a distance of two miles. The valley beneath is overwhelmed with their fragments to the extent of half a mile. In many parts of the precipice, they produce, before their descent, a cavernous appearance, and even a romantic overhanging scenery, highly dangerous to be approached. It is affirmed by the most intelligent of the neighbouring inhabitants, that this mountain chiefly wastes during violent storms of snow and rain; and Mr. Martin, who published an account of Mam Tor, in the Philosophical Transactions for 1729, affirms that the decay is not constantly the same. He not only surveyed it closely, but ascended the steepest part of the

precipice, without tracing any other shivering in the mountain, beside that which was occasioned by the treading of his feet in the loose crumbled earth.

THE EBBING AND FLOWING WELL.

In the vicinity of Chapel-en-le-Frith is a steep hill, rising to the height of more than a hundred feet, immediately beneath which this natural phenomenon lies. It is of an irregular form, but nearly approaching to a square, from two or three feet in depth, and about twenty feet in width.

Its ebbings and flowings are irregular, and dependent on the quantity of rain which falls in the different seasons of the year; when it begins to rise, the current can only be perceived by the slow movement of the blades of grass, or other light bodies floating on the surface; notwithstanding which, before the expiration of a minute, the water issues, with a guggling noise, in considerable quantities, from several small apertures on the south and west sides The interval of time between the ebbing and flowing is not always alike; consequently the proportion of water it discharges at different periods, also varies. In the space of five minutes flowing, the water occasionally rises to the height of six inches; and, after remaining a few seconds stationary, the well assumes its former quiescent state.

The cause of the intermittent *flowing* of this well may be satisfactorily explained, on the principle of the action of the syphon, and on the supposition of a natural one communicating with a cavity in the hill, where the water may be supposed to accumulate:—but for the phenomenon of its *ebbing*, no satisfactorily reason has been assigned. The opinion of a second syphon, as ingeniously advanced by a modern Tourist, which begins to act when the water rises, is inconsistent with the appearance of the well, and therefore cannot be just.

ST. ANNE'S WELL.

This Well, the usual resort of the company who frequent Buxton to drink the waters, has been classed among the wonders of the Peak, on account of this singularity—that within five feet of the hot spring by which it is supplied,

a cold one arises. This is not, however, the only well of the kind, since hot and cold springs rise near each other in many parts of England, and in other countries. The water is conveyed to the well, which is an elegant classical building, in the Grecian style, from the original spring, by a narrow passage, so close and well contrived as to prevent it from losing any considerable portion of its heat, and is received in a white marble bason. It is not so warm as the Bath water, its temperature being about 80 degrees of Fahrenheit.

THE CRYSTALLIZED CAVERN.

THE CRYSTALLIZED CAVERN, the new wonder of the Derbyshire Peak, has been recently discovered in the vicinity of the village of Bradwell. We extract the following particulars of this singular and beautiful natural excavation from Hutchinson's late Tour in the High Peak.

The entrance is rather terrific than grand; and the descent for about thirty paces very abrupt. The visitor has then to pass along an inclined way for nearly a quarter of a mile, the opening being so low that it is impossible to proceed, in particular parts, in an erect posture. The different crystallizations which now attract his attention on every side, soon make him forget the irksomeness of the road, and banish every idea of fatigue. New objects of curiosity crowd one on the other: in a place called the *Music Chamber*, the petrifactions take the semblance of the pipes of an organ; while in other parts, these stalactites are formed into elegant small colonnades, with as exact a symmetry as if they had been chiselled by the most skilful artist. Candles judiciously disposed within them, give an idea of the imaginary palaces of fairies, or of sylphs and genii, who have chosen this for their magnificent abode.

Still he has seen nothing comparable to what he is now to expect; for, at the distance of about a hundred paces further, by a rugged descent, he enters what is called the *Grotto of Paradise*. This heavenly spot, for it cannot be compared to any thing terrestrial, is, of itself, a beautiful crystallized cavern, about twelve feet high, and in length twenty feet, pointed at the top, similar to a gothic arch, with a countless number of large stalactites hanging from the

roof. Candles placed among them give some idea of its being lighted up with elegant glass chandeliers; while the sides are entirely incrusted, and brilliant in the extreme. The floor is chequered with black and white spar. It has altogether, Mr. Hutchinson observes, the most novel and elegant appearance of any cavern he ever beheld. This glittering apartment would be left by the visitor with a certain degree of regret, did he not expect to see it again on his return.

Still continuing a route similar to the one he has passed, in the course of which his attention is occasionally arrested by the curiosities of the place, and by the gentle droppings of the water, which scarcely break the solemn silence of the scene, he at length reaches the *Grotto of Calypso*, and the extremity of the cavern, upwards of 2000 feet from the entrance. To see this grotto to advantage, he has to ascend about six feet, into a recess. There, the beautiful appearances of the different crystallizations, some of them of an azure cast, and the echoes reverberating from side to side, make him fancy that he has reached the secluded retreat of some mythological deity.

Returning by the same path for a considerable distance, another cavern, which branches in a south-western direction from the one already explored, presents itself. The roads here are still more difficult of access, but the stalactites are certainly most beautiful. Many of them, more than a yard in length, are pendent from the roof, and the greater part do not exceed the dimension of the smallest reed. The top and sides of this cavern are remarkably smooth, particularly at the part called the *Amphitheatre*. In general, the stone is of a very dark colour, to which the transparent appearances before mentioned, with each a drop of water hanging at its extremity, form a fine contrast.

SPEEDWELL LEVEL.

In the Speedwell Level, or Navigation Mine, in the vicinity of Castleton, art has been combined with the subterraneous wonders of nature. Being provided with lights, the guide leads the visitor beneath an arched vault, by a flight of 106 steps, to the *sough* or level, where a boat is ready for his reception, and which is put in motion by

pushing against pegs driven into the wall for that purpose. After proceeding about one third of a mile through various caverns, the level bursts into a tremendous gulf, the roof and bottom of which are invisible, but across which the navigation has been carried, by throwing a strong arch over a part of the fissure where the rocks are least separated. Here, leaving the boat, and ascending a stage erected above the level, the attention of the visitor is directed to the dark recess of the abyss beneath his feet; and firm indeed must be his resolution, if he can contemplate the scene unmoved, and without an involuntary shudder. To the depth of ninety feet all is vacuity and gloom; but beyond that commences a pool of stygian waters, not unaptly named the *bottomless pit*, the prodigious range of which may in some measure be conceived, by the circumstance of its having swallowed up more than 40,000 tons of rubbish, made in blasting the rock, without any apparent diminution either of its depth or extent. The guides assert that the former has not been ascertained; but there is reason to believe that its actual depth in standing water is about 320 feet. There cannot, however, be a doubt but that this abyss has communications with others still more deeply situated in the bowels of the mountain, and into which the precipitated rubbish has found a passage. The superfluous water of the level falls through a water-gate into this profound caldron, with a noise like a rushing torrent.

This fissure is calculated to be about 800 feet beneath the surface of the mountain; and so great is its reach upward, that rockets of sufficient strength to ascend 450 feet, have been fired without rendering the roof visible. The effect of a Bengal light discharged in this stupendous cavity is extremely magnificent and interesting.

THE HIGH TOR.

This is one of the many sublime objects presented by Matlock Dale, the beauties of which will be cursorily described, in proportion as these objects pass under our review.

In approaching the bath, which is nearly a mile to the south-west of the village of Matlock, a specimen of the

scenery by which this charming vale is distinguished, presents itself. The entrance is through a rock, which has been blasted for the purpose of opening a convenient passage;—and here a scene which blends the constituent principles of the picturesque, the beautiful, and the sublime, opens suddenly on the view. Through the middle of a narrow plain flows the Derwent, overhung by a profusion of luxuriant beeches and other drooping trees. Towards the east are gently rising grounds; and on the west the huge mural banks of the vale stretch along, the white face of the rock of which they are composed occasionally displaying itself through the woody clothing of their sides and summits. This magnificent scenery is singularly contrasted by the manufactories and lodging-houses at the bottom of the vale.

To see this magic spot to the greatest advantage, it should be entered at its northern extremity, its beauties then succeeding each other in a proper gradation, and their grandeur and effect being rendered more impressive. The chief attention is now attracted to the HIGH TOR, a grand and stupendous rock, which appears like a vast abrupt wall of limestone, and rises almost perpendicularly from the river, to the height of upwards of 350 feet. The lower part of this majestic feature is shaded by yew trees, elms, limes, and underwood of various foliage; but the upper part, for fifty or sixty yards, presents a rugged front of one broad mass of perpendicular rock. From its summit the vale is seen in all its grandeur, diversified by woods of various hues and species. The windings of the Derwent, the greyish-coloured rocks, and the white fronts of the houses, embosomed amidst groves of trees which sprout from every crevice of the precipices, give variety and animation to a scene of wonderful beauty.

CHEE TOR.

IN a romantic and deep hollow, near the little village of Wormhill, the river Wye flows beneath this stupendous mass of rock, which rises perpendicularly more than 360 feet above its level. The channel of the river, which meanders at the base, is confined between huge rocks of limestone, having such a general correspondence of situa-

tion and form, as to render it probable that they were once united. In some parts they are partially covered with brush-wood, nut-trees, and mountain-ash; while in others, they are totally naked, precipitous, and impending. The chasm runs in a direction so nearly circular, that the sublime CHEE TOR, and its dependant masses of rock, are almost insulated by the river which rolls at their feet. Its length, as far as it possesses any considerable beauty, is between five and six hundred yards; a distance which presents several picturesque and interesting views, the general effect of the fine scenery being enhanced by the plantations on the neighbouring heights, and by a spring which flows into the river near the bottom of a deep descent. From a particular station in this romantic spot, the four vallies of Wye Dale, Chee Dale, Flag Dale, and Water Dale, may be [illegible] together with the Tor and river.

MASSON HILL.

Where as proud MASSON rises rude and bleak,
And with mis-shapen turrets crests the peak,
Old MATLOCK gapes, with marble jaws beneath,
And o'er scar'd DERWENT bends his flinty teeth;
Deep in wide caves, below the dangerous soil,
Blue sulphurs flame, imprison'd waters boil.
Impetuous streams in spiral columns rise
Through rifted rocks, impatient for the skies;
Or, o'er bright seas of bubbling lavas blow,
As heave and toss the billowy fires below;
Condens'd on high, in wandering rills they glide,
From MASSON'S dome, and burst his sparry side;
Round his grey towers, and down his fringed walls,
From cliff to cliff the liquid treasure falls;
In beds of stalactite, bright ores among,
O'er corals, shells, and crystals, winds along;
Crusts the green mosses, and the tangled wood,
And sparkling plunges to its parent flood.

DARWIN'S LOVES OF THE PLANTS.

THIS very high eminence is directly opposite to the HIGH TOR, but rises with a less steep ascent. Its summit is named the *Heights of Abraham*, from its resemblance to the heights of that name near Quebec, rendered so memorable by the enterprize of the gallant Wolfe in 1759. It overlooks the country to a vast extent, so as to command a view

of almost the whole length of the valley. Its considerable elevation above the surrounding objects greatly changes their general size and appearance. Even the HIGH TOR seems considerably diminished in grandeur and sublimity; but this effect is partly compensated by the extent of the prospect, and the variety of objects it comprehends. The height of this eminence is about 750 feet, the path to its summit having been carried, in a winding direction, through a grove. At the one half of its ascent is an alcove, from which an extensive view of a great part of Matlock Dale may be seen, through a fine avenue formed for that purpose.

THE CUMBERLAND CAVERN.

To the west and north-west of the village of Matlock are three apertures in the rock, respectively named the CUMBERLAND, SMEDLEY, and RUTLAND Caverns. The former of these is well deserving of a short notice.

The entrance is partly artificial, to afford a greater facility to the visitor, who has to descend fifty-four steps. The cavern now opens on him in solitary grandeur. Huge masses of stone are piled on each other with a tremendous kind of carelessness, evidently produced by some violent concussion, though at an unknown period. He is conducted to a long and wide passage, the roof which has all the regularity of a finished cieling, and is bespangled by spars of various descriptions. From above, from beneath, and from the sides, the rays of the lights are reflected in every direction. In an adjacent compartment rocks are heaped on rocks in terrible array, and assume a threatening aspect. Next is an apartment decorated with what, in the language of the country, is called the *snow fossil*—a petrifaction which, both in figure and colour, resembles snow, as it is drifted by the winter storm into the cavities of a rock. Near the extremity of the cavern are to be seen fishes petrified and fixed in the several strata which form the surrounding recess One of these has its back *jutting out* of the side of the earth, as if it had been petrified in the act of swimming. In another branch of the cavern a well has been found of a considerable depth.

REYNARD'S HOLE.

AFTER having proceeded about a mile in DOVE DALE, the romantic and sublime beauties of which will be hereafter noticed, by a route constantly diversified by new fantastic forms, and uncouth combinations of rock, the visitor is led to a mass of mural rock, bearing the above name, and perforated by nature into a grand arch, nearly approaching to the shape of the sharply-pointed gothic style of architecture, about forty-five feet in height, and in width twenty. Having passed through this arch, a steep ascent leads to a natural cavern, called REYNARD'S HALL, forty-five feet in length, fifteen in breadth, and in height thirty. From the mouth of this cavern the scenery is singular, beautiful, and impressive. The face of the rock, which contains the arch, rises immediately in front, and would effectually prevent the eye from ranging beyond its mighty barrier, did not its centre open into the above-mentioned arch, through which is seen a small part of the opposite side of the Dale, consisting of a mass of gloomy wood, from the shade of which a huge detached rock, solitary, cragged, and pointed, starts out to a great height, and forms an object truly sublime. This rock, which has received the name of DOVE DALE CHURCH, is pleasingly contrasted by the little pastoral river DOVE, and by its verdant turfy banks. A narrow opening at the extremity of the cavern is supposed to lead to other similar cavities in the rock; and on the left is a cavern, about forty feet in length, in breadth fourteen, and in height twenty-six, called REYNARD'S KITCHEN, from the interior of which a pleasing view is presented of the upper part of the dale, its river, and rocks.

After passing REYNARD'S HOLE, already described, the rocks rise more abruptly on either side, and appear in shapes more wild and irregular, but diversified and softened by shrubs.

DOVE DALE is nearly three miles in length; but from the sinuosity of its course, and its projecting precipices, the views are limited. Throughout the whole of this majestic feature of country, the river Dove flows, in the halcyon days of summer, with soft murmurs, innocently and transparently over its pebbly bed; but swells into rage during the

winter months. Little tufts of shrubs and underwood form islands in miniature within its bed, which enlarge and swell the other objects. The scenery of this Dale is distinguished from almost every other in the United Kingdoms, by the rugged, dissimilar, and frequently grotesque and fanciful appearance of the rocks. To employ the words of a late tourist, "It is, perhaps, on the whole, one of the most pleasing sceneries of the kind any where to be met with. It has something peculiarly characteristic. Its detached, perpendicular rocks stamp it with an image entirely its own, and for that reason it affords the greater pleasure. For it is in scenery as in life. We are most struck with the peculiarity of an original character, provided there be nothing offensive in it."

THOR'S HOUSE.

Where Hamps and Manifold, their cliffs among,
Each in his flinty channel winds along,
With lucid lines the dusky moor divides,
Hurrying to intermix their sister tides,
Where still their silver-bosom'd nymphs abhor
The blood-smear'd mansion of gigantic THOR—
Erst fires volcanic in the marble womb
Of cloud-wrapp'd WHETTON rais'd the massy dome
Rocks rear'd on rocks, in huge disjointed piles,
Form the tall turrets, and the lengthen'd aisles;
Broad pond'rous piers sustain the roof, and wide
Branch the vast rainbow ribs from side to side.
While from above descends, in milky streams,
One scanty pencil of illusive beams,
Suspended crags, and gaping gulfs illumes,
And gilds the horrors of the deepen'd glooms,
—Here oft the Naiads, as they chance to stray
Near the dread Fane, on Thor's returning day,
Saw from red altars streams of guiltless blood,
Stain their green reed-beds, and pollute their flood;
Heard dying babes in wicker prisons wail,
And shrieks of matrons thrill the affrighted gale;
While from dark caves infernal echoes mock,
And fiends triumphant shout from ev'ry rock!

DARWIN.

THIS spacious cavern is situated about two miles above Dove Dale, near the village of Whetton; and tradition says that the Druids here offered human sacrifices, inclosed in wicker idols, to Thor, the principal deity of the Saxons

and Danes, in the ages of their idolatrous worship. Beneath is an extensive and romantic common, where the rivers Hamps and Manifold sink into the earth, and rise again in Islam gardens. These rivers merit a brief description. A wooden bridge has been thrown over an abyss in the rock, out of which the river MANIFOLD bursts with surprising force, after having pursued a subterraneous course of five miles, from the point where it had engulfed itself in the earth, called WESTON HILL. At the further distance of twenty yards a similar phenomenon occurs; for here another fissure in the rock presents itself, whence the river HAMPS throws its waters into day. This river disappears at LEEK-WATER HOUSES, a place between LEEK and ASHBOURN; thus pursuing a subterraneous course of seven miles, before it again emerges into light. On their emersion, the temperature of the two rivers differs two degrees and a half, the HAMPS being the coldest.

THE LOVERS' LEAP.

THE environs of Buxton abound in romantic sites, among the most striking of which is the Dale named the LOVERS' LEAP, on account of a vast precipice which forms one side of a narrow chasm, and from the summit of which a love-lorn female is said to have precipitated herself into the rocky gulf below. Each side of this beautiful dell is bounded by elevated rocks, the proximity of which is such, that for a considerable space there is scarcely room for the passage of the bubbling current of the Wye. Several of these rocks are perpendicular, and bare of vegetation; while others are covered with ivy, yew, and ash-wood, with a craggy steep occasionally starting through the verdure. A circular road, extending in circumference about three miles, passes in view of the most romantic part of this dale, and forms a very agreeable walk or ride from Buxton. At the southern extremity the scenery assumes a milder character, the hollow taking the name of MILL DALE, from a mill which is turned by the stream. In conjunction with a rude bridge, a mountainous path, and other rural objects, this forms a very picturesque view. Another fine scene is presented by a lofty rock, called SWALLOW TOR, which soars over a mass of wood, the river at its base foaming and roaring over broken masses of limestone.

THE MOORS.

DERBYSHIRE is every where fruitful in natural curiosities, among the most striking of which may be reckoned the Moors of Hope Parish, inasmuch as they afford an extraordinary instance of the preservation of human bodies interred in them. In the year 1674 a grazier and his female servant, in crossing these Moors on their way to Ireland, were lost in the snow, with which they were covered from January to May, when, on their being found, the bodies were so offensive that the Coroner ordered them to be buried on the spot. After a lapse of twenty-nine years, on the ground being opened, they were in no way changed, the colour of the skin being fair and natural, and the flesh as soft as that of persons newly dead. For twenty succeeding years they were occasionally exposed as a spectacle, but carefully covered after being viewed. They lay at the depth of about three feet, in a moist soil, or moss. The Minister of Hope Parish was present in 1716, forty-two years after the accident, at a particular inspection of these bodies. On the stockings being drawn off, the man's legs, which had not been uncovered before, were quite fair: the flesh, when pressed by the finger, pitted a little; and the joints played freely, without the least stiffness. Such parts of the clothing as the avidity of the country people, to possess so great a curiosity, had spared, were firm and good; and a piece of new serge, worn by the woman, did not appear to have undergone any sensible change.

OTHER ENGLISH CURIOSITIES

Having thus brought to a conclusion our details relative to the wonders of the Peak, and the various and interesting natural curiosities there to be found, we subjoin a brief notice of several others, which have, in our Island, attracted the notice of travellers.

Among the extraordinary caverns to be found in the mountains of the north of England, may be reckoned Yordas Cave, in the vale of Kingsdale, in Yorkshire, which contains a subterraneous cascade. Whethercot Cave, not

far from Ingleton, is divided by an arch of limestone, passing under which is seen a large cascade falling from a height of more than sixty-feet. The length of this Cave is about one hundred and eighty-feet, and the breadth ninety.

There are also in various parts of England many remarkable springs, of which some are impregnated either with salt, as that of Droitwich, in Worcestershire; or sulphur, as the famous well of Wigan, in Lancashire, or bituminous matter, as that at Pitchford, in Shropshire. Others have a petrifying quality; as that near Lutterworth, in Leicestershire, and a dropping well in the West Riding of Yorkshire. And, finally, some ebb and flow, as that of the Peak described above, and Laywell near Torbay, whose waters rise and fall several times in an hour. To these we may add that remarkable fountain near Richard's Castle, in Herefordshire, commonly called Bone Well, which is generally full of small bones, like those of frogs or fishes, though often cleared out. At a cliff near Wigan, in Lancashire, is the famous burning well; the water is cold, neither has it any smell; yet so strong a vapour of sulphur issues out with the stream, that upon applying a light to it, the top of the water is covered with a flame, like that of burning spirits, which lasts several hours, and emits such a heat that meat may be boiled over it.

BRITISH MOUNTAINS.

The British Isles present many mountains of a bold and imposing character: when contrasted, however, with those which have been already described, they must be considered as comparatively diminutive.

BEN NEVIS.

The loftiest of these mountains is Ben Nevis, in Scotland, its elevation above the level of the sea being 4380 feet, somewhat more than four-fifths of a mile. It terminates in a point, and elevates its rugged front far above all the neighbouring mountains. It is of easy ascent; and at the perpendicular height of 1500 feet, the vale beneath presents a very

agreeable prospect, the vista being beautified by a diversity of bushes, shrubs, and birch woods, beside many little verdant spots. The sea and the shore are also seen.

At the summit, the view extends at once across the Island, eastwards towards the German sea, and westward to the Atlantic Ocean. Nature here appears on a majestic scale, and the vastness of the prospect engages the whole attention, at the same time that the objects in view are of no common dimensions. Just over the opening of the sound, at the south-west corner of Mull, Colonsay rises out of the sea, like a shade of midst, at the distance of more than ninety miles. Shuna and Lismore appear like small spots of rich verdure, and, though nearly thirty miles distant, seem quite under the spectator. The low parts of Jura cannot be discerned, nor any part of Isla; far less the coast of Ireland, as has been asserted. Such is, however, the wide extent of view, that it extends 170 miles from the horizon of the sea at the Murray Firth, on the N. E., to the Island of Colonsay, on the S. W.

On the N.E. side of Ben Nevis is an almost perpendicular precipice, certainly not less than 1400 feet in depth: probably more, as it appears to exceed the third part of the entire height of the mountain. A stranger is astonished at the sight of this dreadful rock, which has a quantity of snow lodged in its bosom throughout the whole year. The sound of a stone thrown over the cliff to the bottom, cannot be heard when it falls, so that it is impossible to ascertain in that way the height of the precipice.

SNOWDON.

This is the loftiest of the Welch mountains, its elevation above the level of the sea being 3720 feet, nearly three quarters of a mile. It is accessible on one side only, its flanks being in every other quarter precipitous. Its aspect soon convinces the spectator that he is not to look to the Alps alone, or to the rocky regions of Altai, bordering on Siberia, for romantic scenes of wildness, confusion, and disorder. Snowdon presents them in all their rude and native majesty.

In the ascent, a narrow path, not more than nine feet in width, leads along the margin of a frightful precipice of

nearly 1500 feet in extent, so perpendicular that it cannot be approached without terror; while to the north of the summit nearest to the one the most elevated, a semi-amphitheatre of precipitous rocks, also of a great height, is seen; and, behind this summit, another semicircle of equal depth and extent. The loftiest summit here appears to descend in the form of a sharp ridge, and beneath it another point appears, which, on account of its colour, is called the BLACK ROCK. From the upper part of the valley one of these summits presents a grand, vertical, and very elevated point.

The bottom of each of the amphitheatres of rocks, thirteen in number, is occupied by a small lake of a circular form, and very deep. The one known by the name of Llyn Glass is remarkable for its green hue, derived from its being impregnated with copper, several mines of which line its borders. Than this mountain nothing in the Alps can be more arid and desert, those regions alone excepted which are too lofty to admit of vegetation. Here there is not a tree; not even a shrub: small patches of verdure, which sheep can scarcely reach, are alone to be seen. Its summit, or highest peak, is a flat of about eighteen feet only in circumference. Thence may be seen a part of Ireland, a part of Scotland, Cumberland, Lancashire, Cheshire, all North Wales, the Isle of Man, and the Irish and British seas, with innumerable lakes; while the whole island of Anglesea is displayed so distinctly, that its flat and uncultivated plains, bounded by the rich Parys mountain in the vicinity of Holyhead, may be descried as on a map.

CADER IDRIS.

To the south of Dolgellau, Cader Idris towers above the subject mountains, which seem to retire, to allow its base more room to stand, and to afford to their sovereign a better display. It stands on a broad rocky base, with a gradual ascent to its brow, when the peaks elevate themselves in a manner at once abrupt, picturesque, and distinct. The point emphatically named CADER, appears to the eye below to be a little superior in height to the saddle; but the third point, or apex, which has a name expressive of its sterility, is neither equal in height, nor in beauty, to the

other two. On its loftiest peak a stone pillar has lately been erected, for the purpose of a trigonometrical survey.

CADER IDRIS is the commencement of a chain of primitive mountains, and is computed to be 2850 feet above the green of Dolgelly, and 3550 feet, nearly three-fourths of a mile, above the level of the sea. A recent traveller has attempted to demonstrate that at some remote period it was a volcano of immense magnitude.

The tract to the south of CADER IDRIS, as far as Talylyn and Malwydd, is peculiarly grand. High and rugged mountains of every possible form close in on all sides, while huge masses of rock hang over, or lie scattered in mishapen fragments by the side of the road. To add to the effect of this scene, the river Difi forms one continued cataract for five or six miles, overflowing with the innumerable tributary torrents which precipitate themselves from the highest summits of the surrounding rocks; while, to crown the whole, the shaggy head of CADER IDRIS towers, the majestic centinel of the group.

PENMAN MAWR.

THE county of Caernarvon, in which this mountain is situated, claims precedency over every other in Wales, for the loftiness of its mountains, and the multitude of the eminences which, in a curved and indented chain, occupy nearly the whole of its extent.

In proceeding from Conway to Bangor, by a route at once picturesque and romantic, and amid a scenery which varies at every step, Penman-mawr discloses to the traveller its bulky head. It protrudes itself into the sea, and exhibits a fine contrast to the fertility which it interrupts, by a rude view of grey weather-beaten stones and precipices. The passage over this mountain was formerly terrific; but the road has been latterly widened, and secured, near the verge of the precipice, by a strong wall about five feet in height. It forms the most sublime terrace in the British Isles, winding round the mountain on the edge of the abrupt cliff; while the vast impending rocks above, the roaring of the waves at a great distance below, and the frequent howling of the wind, all unite to fill the mind with solemnity and awe

SKIDDAW.

This English mountain, which has an elevation of 3530 feet, nearly three fourths of a mile, above the level of the sea, is situated in Cumberland. It is more remarkable on account of the scenery over which it presides, and which exceeds in beauty whatever the imagination can paint, than for those bold projections and that rugged majesty which might be expected, but which will be here sought in vain. Except at such a distance as smooths the embossed work of all these rich fabrics, and where its double summit makes it a distinguished object to mark and characterize a scene, it may be considered as a tame and inanimate object.

WHARNSIDE.

In the map of Yorkshire, by Jeffries, the height of this mountain is greatly exaggerated, its elevation above the sea not being more than 2500 feet, nearly half a mile. As it is situated in the midst of a vast amphitheatre of hills, the prospect it affords is diversified with pleasing objects. On its summit are four or five small lakes, two of which are about nine hundred feet in length, and nearly the same in breadth. A thin seam of coal also occurs near the top, and another is said to correspond with it on the summit of the lofty Colm-hill, on the opposite side of Dent-dale. Numerous caves and other natural curiosities abound here, as well as on Pennigent, about six miles to the eastward of Ingleborough. These latter mountains do not possess any particular interest.

STROMBOLI.

This is the principal of the cluster of small Islands, lying to the north of Sicily, named the Lipari Isles, the whole of which contain volcanoes. At a distance its form appears to be that of an exact cone, but on a closer examination it is found to be a mountain having two summits of different heights, the sides of which have been torn and

shattered by craters. The most elevated summit, inclining to the S. W., is, agreeably to Spallanzani, about a mile in height.

In this volcanic mountain the effects of a constantly active fire are every where visible, heaping up, destroying, changing, and overturning every instant what itself has produced, and incessantly varying in its operations. At the distance of one hundred miles the flames it emits are visible, whence it has been aptly denominated the light-house of that part of the Mediterranean sea.

From the more elevated summit, all the inner part of the burning crater, and the mode of its eruption, may be seen. It is placed about half way up, on the N. W. side of the mountain, and has a diameter not exceeding 250 feet. Burning stones are thrown up at regular intervals of seven or eight minutes, ascending in somewhat diverging rays. While a portion of them roll down towards the sea, the greater part fall back into the crater; and these being again cast out by a subsequent eruption, are thus tossed about until they are broken and reduced to ashes. The volcano, however, constantly supplies others, and seems inexhaustible in this species of productions. Spallanzani affirms that, in the more violent eruptions, the ejected matter rises to the height of half a mile, or even higher, many of the ignited stones being thrown above the highest summit of the mountain.

The erupted stones, which appear black in the day-time, have at night a deep red colour, and sparkle like fire-works. Each explosion is accompanied by flames or smoke, the latter resembling clouds, in the lower part black, in the upper white and shining, and separating into globular and irregular forms. In particularly high winds from the S. or S. E. the smoke spreads over every part of the island. Spallanzani observed this volcano on a particular night, when the latter of these winds blew with great violence. The clear sky exhibited the appearance of a beautiful aurora borealis over that part of the mountain on which the volcano is situated, and which from time to time became more red and brilliant, in proportion as the ignited stones were thrown to a greater height. The violence of the convulsions depends on that of the wind.

The present crater has burned for more than a century,

without any apparent change having taken place in its situation. The side from which the showers of ignited matter fall into the sea, is almost perpendicular, about half a mile broad at the bottom, and a mile in length, terminating above in a point. In rolling down, the lava raises the fine sand like a cloud of dust. While this was observed by Spallanzani, the volcano suddenly made an eruption. Numerous pieces of lava, of a dark red colour, and enveloped in smoke, were ejected from the top of the precipice, and thrown high into the air. A part of them fell on the declivity, and rolled down, the smaller preceded by the greater; and, after a few bounds, dashed into the sea, giving out a sharp hissing sound. The more minute fragments, from their lightness, and the hinderance of the sand, rolled slowly down, and, striking against each other, produced nearly the same sound as hail-stones falling on a roof. In a few minutes another explosion followed, without any sensible noise; and two minutes after, a third eruption took place, with a much louder explosion than the first, and a far more copious ejection of lava. The eruptions, which were almost innumerable during the time Spallanzani remained there, all exhibited the same appearances.

On the night following the one above described, the volcano raged with still greater violence, and rapidly hurled to a great height thousands of red-hot stones, forming diverging rays in the air. Those which rolled down the precipice produced a hail of streaming fire, which illuminated the steep descent. Independently of these ignited stones, there was, in the air which hovered over the volcano, a vivid light, which was not extinguished when that was at rest. It was not properly flame, but real light reverberated by the atmosphere, impregnated by extraneous particles, and more especially by the ascending smoke. Besides varying in intensity, it appeared constantly in motion, ascending, descending, dilating, and contracting, but always remaining perpendicular over the mouth of the volcano, which showed that it was occasioned by the conflagration within the crater. The detonations in the greater eruptions resembled the roaring of distant thunder; but, in the more moderate ones, the explosions of a mine. In the smallest they were scarcely audible. Each was some seconds later than the ejection.

Near the mouth of the volcano is a small cavern, a projection above which secures it from the entrance of the ignited stones. From this cavern Spallanzani was enabled to look down into the very bowels of the volcano. He describes the edges of the crater as of a circular form, and not more than 340 feet in circumference, the internal sides contracting as they descend, and assuming the shape of a truncated inverted cone. The crater itself, to a certain height, is filled with a liquid red-hot matter, resembling melted brass. This is the fluid lava, which appears to be agitated by two distinct motions, the one intestine, whirling and tumultuous, and the other that by which it is impelled upward. This liquid matter is raised, sometimes with more, and sometimes with less rapidity, within the crater; and when it has reached within twenty-five or thirty feet of the upper edge, a sound is heard not unlike a short clap of thunder, while at the same moment a portion of the lava, separated into a thousand pieces, is thrown up with indescribable swiftness, accompanied by a copious eruption of smoke, ashes, and sand. A few moments before the report, the superficies of the lava is inflated and covered with large bubbles, some of which are several feet in diameter: on the bursting of these the detonation and fiery shower take place. After the explosion, the lava within the crater sinks, but soon rises again as before, and new bubbles appear, which again burst and produce new explosions. When the lava sinks, it gives little or no sound; but when it rises, and particularly when it begins to be inflated with bubbles, it is accompanied by a noise similar, in proportion to the difference of magnitude, to that of liquor boiling vehemently in a cauldron.

LIPARI.

This island, which has given name to the whole cluster, is deserving of notice on account of its celebrated stoves. They are the only vestiges of subterraneous conflagration now remaining, and lie to the west of the city, on the summit of a mountain of considerable elevation, called Monte della Stufe, the Mountain of Stoves. They consist of five excavations, in the form of grottoes; but two of them have been abandoned on account of the great

heat, an exposure to which might cause suffocation. Even the stones are so hot that they cannot be touched; but still the heat varies, and experiences all the vicissitudes of volcanoes. The ground is not penetrated with hot vapours issuing from several apertures, as has been asserted: Spallanzani, however, found one from which a thin stream of smoke issued from time to time, with a strong sulphureous smell indicating the remains of the conflagration existing beneath.

It is impossible to fix the exact epoch at which the fires of Lipari were extinguished, or rather the period at which the eruptions ceased, for the existence of the former may be deduced from the hot springs and stoves. Dolomieu thinks that the last eruptions are as old as the sixth century of the Christian era, and conjectures that they may have ceased since the fires found a new vent in Vulcano, since he does not entertain any doubt but that the two islands have a subterraneous communication. Of this the inhabitants of Lipari are so well convinced, that they are in the greatest agitation when Vulcano does not smoke, and when its passages are obstructed. They fear shocks and violent eruptions, suspecting even that the fires may again break out in their own island. It is certainly a fact that the earthquakes, which are very frequent, generally cease when the eruptions of Vulcano commence.

VULCANO.

This, which is the last of the Lipari isles, bears in every part the stamp of fire. It was the superstitious belief of the ancient inhabitants that Vulcan had here established his forges, there being constant fires during the night, and a thick smoke throughout the day. It consists of a mountain in the form of a truncated cone, which is, however, merely a case opening and exposing to view a second cone within, more exact than the other, and in which the mouth of the volcano is placed. The latter is thus enveloped on three sides by the ancient cone, and is only open on that side which is immediately washed by the sea.

The base of the interior cone is separated from the steep sides of the ancient crater by a circular valley, which terminates on one side at the junction of the two mountains,

and on the other sinks into the sea. In this valley light pumice-stones are blended with fragments of black vitreous lava, and buried in ashes perfectly white. The blow of a hammer on these stones produces a loud hollow sound, which re-echoes in the neighbouring caverns, and proves that the surface is nothing more than the arch of a vault covering an immense abyss. The sound varies according to the thickness of the crust, which must have considerable solidity to support the weight of the new mountain. This, according to Dolomieu, is higher and steeper than the cone which contains the crater of Etna, and its access still more difficult; its perpendicular height, however, is not more than 2640 feet, half a mile. He represents the crater of Vulcano as the most magnificent he ever saw; and Spallanzani observes that, with the exception of that of Etna, he does not know of any more capacious and majestic. It exceeds a mile in circuit, has an oval mouth, and its greatest diameter is from the S. E. to the W., while its depth is not more than a quarter of a mile. The bottom is flat, and from many places streams of smoke exhale, emitting a strong sulphureous vapour. This vast cavity is very regular, and, as its entire contents are displayed to the eye, presents one of the grandest and most imposing spectacles in nature. On large stones being rolled down, the mountain re-echoes; and on their reaching the bottom, they appear to sink in a fluid. Indeed, with the aid of a glass, two small lakes, supposed to be filled with melted sulphur, have been discovered. The declivity of the interior walls is so great, that, even when there is not any danger from fire, the descent is next to impossible. After considerable difficulty, however, this was accomplished by Spallanzani on the S.E. side, the only one accessible. He found the bottom to be somewhat more than one third of a mile in circumference, and of an oval form. The subterraneous noise was here much louder than on the summit, sounding like an impetuous river foaming beneath, or, rather, like a conflict of agitated waves meeting and clashing furiously together. The ground was likewise in some places perforated with apertures, from which hissing sounds issued, resembling those produced by the bellows of a furnace. It shook when pressed by the feet; and a large piece of lava, let fall five or six feet, produced a subterraneous echoing sound, which continued some time, and was loudest in the

centre. These circumstances, combined with its burning heat, and the strong stench of sulphur it emits, prove that the fires of the volcano are still active.

Its eruptions have been most considerable during the earthquakes which have desolated Sicily and a great part of Italy. In the month of March, 1786, after subterraneous thunders and roarings, which were heard over all the Islands, to the great terror of the inhabitants, and were accompanied by frequent concussions, the crater threw out a prodigious quantity of sand, mixed with immense volumes of smoke and fire. This eruption continued fifteen days, and so great was the quantity of sand ejected, that the circumjacent places were entirely covered with it to a considerable height. The lava did not flow at the time, at least over the edges of the crater; and, indeed, such a current has not happened during the memory of any living person.

THE HIMALAYA MOUNTAINS,

BETWEEN INDIA AND THIBET.

The great Himalayan snowy range, says Mr. Fraser, s only the highly elevated crest of the mountainous tract that divides the plains of Hindostan from those of Thibet, or Lesser Tartary. Far as they predominate over, and precipitously as they rear themselves above the rest, all the hills that appear in distant ranges, when viewed from the plains, are indeed only the roots and branches of this great stem; and, however difficult to trace, the connexion can always be detected between each inferior mountain and some particular member of its great origin.

The horizontal depth of this mountainous tract, on that side which overlooks Hindostan, is no doubt various; but, from the difficulty of the country, a traveller performs a journey of many days before he reaches the foot of the immediate snowy cliffs. The best observations and survey do not authorise the allowance of more than an average depth of about sixty miles from the plains to the commencement of these, in that part of the country that form the subject of this narrative. The breadth of the snowy zone itself in all probability varies still more;

for huge masses advance in some places into the lower districts, and in others the crest recedes in long ravines, that are the beds of torrents, while behind they are closed by a succession of the loftier cliffs. Every account we receive of a passage through them, (and this is no doubt found most commonly where the belt is narrowest,) gives a detail of many days' journey through deserts of snow and rocks; and it is to be inferred, that on the north-east side they advance to, and retreat from the low ground in an equally irregular manner. Indeed, some accounts would induce the belief, that long ranges, crowned with snow-clad peaks, project in various places from the great spine, and include habitable and milder districts; for, in all the routes of which we have accounts, that proceed in various directions towards the Trans-Himalayan countries, hills covered with snow are occasionally mentioned as occurring, even after the great deserts are passed, and the grazing country entered. The breadth, then, of this crest of snow-clad rock itself cannot fairly be estimated at less than from seventy to eighty miles.

The great snowy belt, although its loftiest crest is broken into numberless cliffs and ravines, nevertheless presents a barrier perfectly impracticable, except in those places where hollows that become the beds of rivers have in some degree intersected it, and facilitated approach to its more remote recesses; and courageous and attentive perseverance has here and there, discovered a dangerous and difficult path, by which a possibility exists of penetrating across the range. Few rivers hold their course wholly through it: indeed, in the upper part in the Sutlej alone has been traced beyond this rocky barrier; and there is a path along its stream, from different parts of which roads diverge, that lead in various directions through the mountains. No reasonable doubt can now exist of the very long and extraordinary course which this river takes.

Captain Webb of the Bengal establishment, was lately employed on a survey of the province of Kumaoon. On the 21st day of June, his camp was 11,680 feet above Calcutta. The surface was covered with very rich vegetation as high as the knee: very extensive beds of strawberries in full flower; and plenty of currant-bushes in blossom all around, in a clear spot of rich black mould

soil, surrounded by a noble forest of pine, oak, and rhododendra. On the 22d of June he reached the top of Pilgoenta-Churhaee, (or ascent,) 12,642 feet above Calcutta. He was prevented from distinguishing very distant objects by a dense fog around him; but there was not the smallest patch of snow near him, and the surface a fat black mould through which the rock peeped, was covered with strawberry plants (not yet in flower), butter-cups, dandelion, and a profusion of other flowers. The shoulders of the hill above him, about 450 feet more elevated, were covered with the same to the top; and about 500 feet below was a forest of pine, rhododendron, and birch. There was some snow seen below in deep hollows, but it dissolves in the course of the season.

These facts led Captain Webb to infer, that the inferior limit of perpetual congelation on the Himala mountains is *beyond* 13,500 feet, at least, above the level of Calcutta: and that the level of the table land of Tartary, immediately bordering on the Himala, is very far elevated beyond 8000 feet, the height at which it has been estimated. journey, I may not be able either to make all the deductions which they will afford, or to shun any errors that they may involve, they will still, I think, yield some ground of inference to estimate the height to which I ascended; and consequently, give some approximation to the heights of the surrounding peaks.

On the night of the 16th July we slept at Bheemkeudar, near the source of the Coonoo and Bheem streams. There is no wood near this place, even in the very bottom of the valley, and we had left even the stunted birch at a considerable distance below: but there was a profusion of flowers, ferns, thistles, &c., and luxuriant pasturage. Captain Webb's limit of wood is at least as high as 12,000 to 12,300 feet. I would, therefore, presume the site of Bheemkeudar to be considerably above that level; say 13,000 to 13,300 feet above the level of Calcutta. From thence we ascended at first rather gradually, and then very rapidly, till we left all luxuriant vegetation, and entered the region of striped and scattered and partially melting snow, (for nearly two miles of the perambulator.) From calculating the distance passed, and adverting to the elevation we had attained, I would presume

that this was at least 1500 feet above Bheemkeudar, or from 14,500 to 15,000 feet above Calcutta.

We proceeded onwards, ascending very rapidly, while vegetation decreased gradually to a mere green moss, with here and there a few snow-flowers starting through it; snow fast increasing, till at length we entered on what I presume was the perennial and unmelting snow, entirely beyond the line of vegetation, where the rock was bare even of lichens: and in this we ascended, as I think, about 800 feet; for, though Bamsooroo Ghat may not be so far above this line, we continued ascending, even after crossing that point, and I would incline to estimate this utmost extent of ascent at 2000 feet more, or nearly 17,000 feet above the level of Calcutta.

Whilst proposing to consider the point of 16,000 to 16,500 feet as that of inferior congelation, I must observe, that there was no feeling of *frost* in the air, and the snow was moist, though hard, chiefly through the influence of a thick mist, which, in fact, amounted to a very small drizzling rain, which fell around: all which would seem to indicate, that the true line of congelation had not there been attained; but we were surrounded by snow which evidently never melted. To a great depth below it extended all over the hills, very little broken, while on the valleys from whence the Coonoo and Bheem streams issue, at full 2000 feet below, it lay covering them and the surrounding mountains, in an unbroken mass, many hundred feet thick. Thus, though it may seem contradictory, the line of perpetual congelation, in fact, seems fixable at even below the point I have ventured to indicate; and, I presume, might on these grounds, be placed somewhere between 15 and 16,000 feet above the level of Calcutta.

The result of all the considerations that arise out of the foregoing remarks is a belief, that the loftiest peaks of the Himala range will be found to fall considerably short of the height attributed to them by Mr. Colebrooke; and that their loftiest peaks do not more than range from 18,000 to 22 or 23,000 feet above the level of the sea.

Having reached the top of an ascent, we looked, says Mr. Fraser, down upon a very deep and dark glen, called Palia Gadh, which is the outlet to the waters of one of the most terrific and gloomy valleys I have ever seen.

But it would not be easy to convey by any description a just idea of the peculiarly rugged and gloomy wildness of this glen: it looks like the ruins of nature, and appears, as it is said to be, completely impracticable and impenetrable. Little is to be seen except dark rock: wood only fringes the lower parts and the waters' edge: perhaps the spots and streaks of snow, contrasting with the general blackness of the scene, heighten the appearance of desolation. No living thing is seen; no motion but that of the waters; no sound but their roar. Such a spot is suited to engender superstition, and here it is accordingly found in full growth. Many wild traditions are preserved, and many extravagant stories related of it.

The glen above described is by far the most gloomy savage scene we have yet met with. I regret that the weather did not permit a sketch of it to be attempted. Beyond this we could see nothing in the course of the river but rocky banks. The opposite side is particularly precipitous; yet along its face a road is carried, which is frequented as much as this, and leads to the villages still farther up. By the time we had reached the village, the clouds which had lowered around and sunk down on the hills, began to burst with loud thunder and heavy rain. The noise was fearfully reverberated among the hills; and during the night more than once the sound was heard of fragments from the brows of the mountains, crashing down to the depths below with a terrific din. Our quarters were good. I slept in a temple, neat, clean, and secure from the weather.

GUNGOTREE, THE SOURCE OF THE JUMNA, A BRANCH OF THE GANGES, IN THE HIMALA MOUNTAINS.

GUNGOTREE, the source of the Jumna, the most sacred branch of the Ganges, ought to hold and does bear the first rank among its holy places. Here, says Mr. Fraser, all is mythological if not holy ground. Here Mahadeo sits enthroned in clouds and mist amid rocks that defy the approach of living thing, and snows that make desolation more awful. Gods, goddesses, and saints here continually adore him at mysterious distance, and you traverse their familiar haunts. But, although Gungotree be the most sacred, it is not the most frequented shrine,

access to it being far more difficult than to Buddrinauth; and consequently to this latter, pilgrims flock in crowds, appalled at the remoteness and danger of the former place of worship. This may pretty fully account for the superior riches and splendour of Buddrinauth. Here are temples of considerable extent, priests and officials in abundance, who preserve an imposing exterior, and an appearance venerable from power and comparative magnificence, and consequently procure rich and ample offerings to keep up their comfortable dignity.

The temple of Bhadri-Nath, is situated on the west bank of the Alacknunda, in a valley four miles long, and one mile in its greatest breadth. The east bank rises considerably higher than the west bank, and is on a level with the top of the temple. The position of the sanctuary is considered equi-distant from two lofty mountains, which are designated by the names of the Nar and the Náráyena Purvatas. The former is to the east, the latter to the west, and completely covered with snow from the summit to the base.

The temple of Bhadri-nath has more beneficed lands attached to it than any sacred Hindu establishment in this part of India. It is said to possess 700 villages in different parts of Gurwhal and Kumaoon: many of them have been conferred by the government; others have been given in pledge for loans; and some few, purchased by individuals, have been presented as religious offerings.

The annual ceremony of carrying the images of their gods to wash in the sacred stream of the Jumna is (it appears) one of much solemnity among the inhabitants of the neighbourhood; and the concourse of people here assembled has been busily engaged, and continues to be fully occupied in doing honour to it. They dance to the sound of strange music, and intoxicate themselves with a sort of vile spirit, brewed here from grain and particular roots, sometimes, it is said, sharpened by pepper. The dance is most grotesque and savage: a multitude of men taking hands, sometimes in a circle, sometimes in line, beating time with their feet, bend with one accord, first nearly to the earth with their faces, then backwards, and then sidewise, with various wild contortions. These, and their uncouth dress of black and gray blankets, give

a peculiar air of brutal ferocity to the assemblage. The men dance all day, and in the evening they are joined by the women, who mix indiscriminately with them, and keep up dancing and intoxication till the night is far advanced. They continue this frantic kind of worship for several days; and, in truth, it is much in unison with their general manners and habits,—savage and inconsistent. At a place so sacred, the residence of so many holy Brahmins, and the resort of so many pious pilgrims, we might expect to find a strict attention to the forms of religion, and a scrupulous observance of the privations and austerities enjoined by it. So far, however, is this from the truth, that much is met with, shocking even to those Hindoos who are least bigotted.

There were several points to be arranged before we could set off for Gungotree, the source of the Jumna. I did not deem it proper to go unarmed; but agreed that only five men should be accoutred to attend us, and that I should myself carry my gun. But all these weapons of war were to be put aside before we got within sight of the holy spot, and deposited in a cave near it, under a guard. I also pledged myself that no use should be made of these instruments, nor any life sacrificed for the purpose of food, either by myself, or by any of my people, after leaving the village, until we returned: moreover, that I would not even carry meat of any sort, dead or alive, along with me, but eat only rice and bread. As to the putting off my shoes, they did not even propose it to me, and it could not have been done; but I volunteered to put them off, when entering into the precincts of the temple and holier places, which pleased them greatly. All the Hindoos, including the Ghoorkhas, went from the village barefoot.

Just at the end of the bridge there is an overhanging rock, under which worship is performed to Bhyram, and a black stone partly painted red, is the image of the god; and here prayers and worship alone were not performed, but every one was obliged to bathe and eat bread baked by the Brahmins, as preparatory to the great and effectual ablutions at the holier Gungotree. This occupied a considerable time, as the party was numerous: in the meantime I took a very imperfect sketch of the scene, after

which I bathed myself at the proper place (which is the junction of the two streams), while the Brahmin prayed over me. Among the ceremonies performed, he made me hold a tuft of grass while he prayed, which at the conclusion he directed me to throw into the eddy occasioned by the meeting of the two waters.

By an unpleasant path we reached a step, or level spot on the first stage of the mountain, where, in a thick grove of fir trees, is placed a small temple to Bhyram, a plain white building, built by order of Ummr Sing T,happa, who gave a sum of money to repair the road, and erect places of worship here, and at Gungotree. Having paid our respects to Byramjee, we proceeded along the side of the hill on the right bank (north) of the river, gradually ascending by a path equally difficult and dangerous as the first part of our ascent, but more fearful, as the precipice to the river, which rolls below us, increases in height, and exceedingly toilsome from the nature of the ground over which it passes, and which consists wholly of sharp fragments from the cliffs above, with fallen trunks and broken branches of trees.

The path increases in difficulty from the very irregular nature of the ground, as well as the steepness of the hill face across which it leads, ascending and descending as the small, though deep, watercourses furrow the mountain side, in loose soil, formed of the small fragments fallen from above, and which slip down, threatening to carry the traveller to the gulph below. The shapeless blocks of rock now more completely obstructed the way, and for hundreds of yards, at times, the passenger must clamber over these masses, heaped as they are one upon another, in monstrous confusion. and so uncertain and unsteady that, huge though they are, they shake and move even under the burthen of a man's weight. So painful indeed is this track, that it might be conceived as meant to serve as a penance to the unfortunate pilgrims with bare feet, thus to prepare and render them worthy for the special and conclusive act of piety they have in view, as the object of their journey to these extreme wilds.

The spot which bears the name of Gungotree is concealed by the roughness of the ground, and the masses of fallen rock, so as not to be seen till the traveller comes close upon it.

The temple is situated precisely on the sacred stone on which Bhagirutte used to worship Mahadeo, and is a small building of a square shape for about twelve feet high, and rounding in, in the usual form of pagodas, to the top. It is quite plain, painted white, with red mouldings, and surmounted with the usual melon-shaped ornaments of these buildings. From the eastern face of the square, which is turned nearly to the sacred source, there is a small projection covered with a stone roof, in which is the entrance facing the east, and just opposite this there is a small pagoda-shaped temple to Bhyramjee. The whole is surrounded by a wall built of unhewn stone and lime, and the space this contains is paved with flat stones. In this space too there is a comfortable but small house for the residence of the Brahmins who come to officiate. Without the inclosure there are two or three sheds constructed of wood, called *dhurum sallahs*, built for the accommodation of pilgrims who resort here: and there are many caves around formed by overhanging stones, which yield a shelter to those who cannot find accommodation in the sheds.

The scene in which this holy place is situated is worthy of the mysterious sanctity attributed to it, and the reverence with which it is regarded. We have not here the confined gloominess of Bhyram Gattee: the actual dread which cannot but be inspired by the precipices and torrents, and perils of the place, here gives way to a sensation of awe, imposing, but not embarrassing, that might be compared to the dark and dangerous pass to the centre of the ruins of a former world; for, most truly, there is little here that recalls the recollection of that which we seem to have quitted. The bare and peaked cliffs which shoot to the skies, yield not in ruggedness or elevation to any we have seen; their ruins lie in wild chaotic masses at their feet, and scantier wood imperfectly relieves their nakedness; even the dark pine more rarely roots itself in the deep chasms which time has worn. Thus on all sides is the prospect closed, except in front to the eastward; where, from behind a mass of bare spires, four huge, lofty, snowy peaks arise; these are the peaks of Roodroo-Himala. There could be no finer finishing, no grander close to such a scene, as is visible in the engraving.

We approach it through a labyrinth of enormous shapeless masses of granite, which during ages have fallen from the cliffs above that frown over the very temple, and in all probability will some day themselves descend in ruins and crush it. Around the inclosure, and among these masses, for some distance up the mountain, a few fine old pine trees throw a dark shade, and form a magnificent fore-ground; while the river runs impetuously in its shingly bed, and the stifled but fearful sound of the stones which it rolls along with it, crushing together, mixes with the roar of its waters.

It is easy to write of rocks and wilds, of torrents and precipices; it is easy to tell of the awe such scenes inspire: this style and these descriptions are common and hackneyed. But it is not so simple, to many surely not very possible, to convey an adequate idea of the stern and rugged majesty of some scenes; to paint their lonely desertness, or describe the undefinable sensation of reverence and dread that steals over the mind while contemplating the deathlike ghastly calm that is shed over them; and when at such a moment we remember our homes, our friends, our firesides, and all social intercourse with our fellows, and feel our present solitude, and far distance from all these dear ties, how vain is it to strive at description! Surely such a scene is Gungotree. Nor is it, independent of the nature of the surrounding scenery, a spot which lightly calls forth powerful feelings. We were now in the centre of the stupendous Himala, the loftiest and perhaps most rugged range of mountains in the world. We were at the acknowledged source of that noble river, equally an object of veneration and a source of fertility, plenty, and opulence to Hindostan; and we had now reached the holiest shrine of Hindoo worship which these holy hills contain. These are surely striking considerations, combining with the solemn grandeur of the place, to move the feelings strongly.

The fortuitous circumstance of being the first European that ever penetrated to this spot was no matter of boast, for no great danger had been braved, no extraordinary fatigues undergone: the road is now open to any other who chooses to attempt it, but it was a matter of satisfaction to myself. The first object of inquiry that naturally

Source of the Jumna, near Gungotree.

occurs to the traveller, after casting a glance over the general landscape, is the source of the river. Here, as at Jumnotree, you are told that no mortal has gone, or can go further towards its extreme origin than this spot; and the difficulty is indeed very apparent. I made a trial to gain a point about two furlongs beyond the temple, both for the purpose of observing the course of the river, and of seeing Gungotree in another point of view. But having with considerable difficulty made my way over the unsteady fragments for some hundred yards, at the risk of being precipitated into the stream, I was forced to turn back.

The source is not more than five miles horizontal distance from the temple, and in a direction south-east, 85° nearly; and beyond this place it is in all probability chiefly supplied by the melting of the great bosom of snow which terminates the valley, and which lies between the peaks of the great mountain above mentioned.

This mountain, which is considered to be the loftiest and greatest of the snowy range in this quarter, and probably yields to none in the whole Himalaya, obtains the name of Roodroo Himala, and is held to be the throne or residence of Mahadeo himself. It is also indiscriminately called Pauch Purbut, from its five peaks; and Soomeroo Purbot, which is not to be confounded with the mountain so called near Bunderbouch; and sometimes the general appellation of Kylas is given, which literally signifies any snowy hill, but is applied to this mountain by way of pre-eminence. It has five principal peaks, called Roodroo Himala, Burrumpooree, Bissenpooree, Oodgurre Kanta, and Soorga Rounee. These form a sort of semi-circular hollow of very considerable extent, filled with eternal snow, from the gradual dissolution of the lower parts of which the principal part of the stream is generated: probably there may be smaller hollows beyond the point to the right above Gungotree, which also supply a portion.

Within the temple there are three images: one, that of Kali: and the elevated stone shelf on which they were placed was wet and soiled with the offerings made: there was a peculiar smell, but I know not whence it proceeded. The place, as usual, was lighted by a small lamp: no

daylight had admittance. Just below the temple, on the river side, grew three poplar-trees, and a few small larches: above there are the remains of a fine old silver firtree, which overshadows some of the caves and sheds. The whole people also bathed, and contributed something to the priesthood; and it was a matter of serious importance, as well as of great joy to every one, that we had thus happily reached a place of such supereminent sanctity: such, indeed, that the act of bathing here is supposed to cleanse from every sin heretofore committed, and the difficulty of which is so great, that few, except professional devotees, ever attempt reaching the holy place.

It is customary that those who have lost their father and mother, or either of these, shall be shaved at this spot; and it was curious to observe the whimsical changes produced by the operation, which numbers underwent. It appears also, that one chief ordinance was the going frequently round the holy temple; and we particularly observed that those who were noted as the greatest rogues were most forward in this pious exercise: one man, in particular, who had been a notorious thief, was unwearied in his perseverance.

Well, indeed, do they say, that Seeva has formed these recesses which he inhabits, inaccessible to all but those whom true devotion leads to his shrine. That man must have been indeed strongly impelled by devotion, ambition, or curiosity, who first explored the way to Gungotree. It were unavailing to enquire, and perhaps of little use, if known, to which of these motives we owe the enterprise; but patience, perseverance, and courage, must have been strongly united with it to lead him safely and successfully through those awful cliffs, that would bar the way to most men. Another omen of favour pointed out was, the increase of the river after bathing, as at Jumnotree; and it is singular enough, that during the time we remained here, I remarked several increases and decreases of the water, without any obvious causes; but these may fairly be referred to the effects of sudden changes of temperature occurring frequently among the hills, and acting on the body of snow that feeds the river.

ASIATIC MOUNTAINS.

Among the Asiatic burning mountains, a brief account of which we introduce after the above interesting notice of the grand Himalaya chain, those of Japan are both remarkable and numerous. On the summit of a mountain in the province of Figo, is a large cavern, formerly the mouth of a volcano, but the flame of which has ceased, probably for want of combustible matter. In the same province, near a religious structure called the Temple of the Jealous God of Aso, a perpetual flame issues from the top of a mountain. In the province of Tsickusen is another burning mountain, where was formerly a coal-pit, which having been set on fire by the carelessness of the workmen, has been burning ever since. Sometimes a black smoke, accompanied by a very disagreeable stench, is observed to issue from the summit of a famous mountain called Fesi, in the province of Seruga. This mountain is said to be nearly as high as the Peak of Teneriffe, but in shape and beauty is supposed not to have an equal. Its top it covered with perpetual snow. Belonging to the Japanese cluster, and not far from Firanda, is a small rocky Island, which has been burning and trembling for many centuries; and in another small Island, opposite to Santzuma, is a volcano which has been burning at different intervals for many ages.

Captain Gore, when leaving Japan, passed by great quantities of pumice-stone, several pieces of which were taken up, and found to weigh from one ounce to three pounds. It was conjectured that these stones had been thrown into the sea by eruptions at various times, as many of them were covered by barnacles (small shells), and others were quite bare.

VOLCANIC MOUNTAINS OF KAMTSCHATKA.

There are three burning mountains in Kamtschatka, which for many years have thrown out a considerable smoke, but do not often burst into flame. One of these is situated in the vicinity of Awatska; and another, named the volcano of Tolbatchiek, on a neck of land between the river Kamtschatka, and the Tolbatchiek. In the beginning of the year 1739 the flames issued with such vio-

lence from its crater, as to reduce to ashes the forests on the neighbouring mountains. This was succeeded by a cloud of smoke, which overspread and darkened the whole country, until it was dissipated by a shower of cinders, which covered the ground to the distance of thirty miles. The third volcano is on the top of the particular mountain of Kamtschatka, which is described as by far the highest in the peninsula. It rises, from two rows of hills, somewhat in the form of a sugar-loaf, to a very great height. It usually throws out ashes twice or thrice a year, sometimes in such quantities, that for three hundred versts, one hundred and sixty-five English miles, the earth is covered with them. In the year 1737, at the latter end of September, a conflagration, which lasted for a week, was so violent and terrific, that the mountain appeared, to those who were fishing at sea, like one red-hot rock; and the flames which burst through several openings, with a dreadful noise, resembled rivers of fire. From the inside of the mountain were heard thunderings, crackings, and blasts like those of the strongest bellows, shaking all the neighbouring territory. During the night it was most terrible; but at length the conflagration ended by the mountain's casting forth a prodigious quantity of cinders and ashes, among which were porous stones, and glass of various colours. When Captain Clarke sailed out of the harbour of St. Peter and St. Paul, in June, 1778, to the northward, an eruption of the first of these volcanoes was observed. A rumbling noise, resembling distant hollow thunder, was heard before day-light; and when the day broke, the decks and sides of the ships were covered with a fine dust, resembling emery, nearly an inch thick, the air at the same time being charged with this substance to such a degree, that towards the mountain, which is situated to the north of the harbour, the surrounding objects were not to be distinguished. About twelve o'clock, and during the afternoon, the explosions became louder, and were followed by showers of cinders, which were in general about the size of peas, though many were picked up on the deck larger than a hazel-nut. Along with the cinders fell several small stones which had not undergone any change from the action of fire.

VOLCANIC MOUNTAIN OF ALBAY.

The following details of the dreadful eruption of the Volcano of Albay, in the island of Luconia, one of the Philippines, on the 1st February, 1814, are from an eye witness of the dreadful scenes it presented.

During thirteen years the volcano of Albay had preserved a profound silence. It was no longer viewed with that distrust and horror with which volcanoes usually inspire those who inhabit the vicinity. Its extensive and spacious brow had been converted into highly-cultivated and beautiful gardens. On the first day of January last, no person reflected, in the slightest degree, upon the damages and losses which so bad a neighbour had once occasioned. Previously to the former eruptions there had been heard certain subterraneous sounds, which were presages of them. But upon the present occasion we remarked nothing, except that on the last day of January we perceived some slight shocks. In the night the shocks increased. At two in the morning one was felt more violent than those hitherto experienced. It was repeated at four, and from that time they were almost continual until the eruption commenced.

The day broke, and I scarcely ever remarked in Camarines a more serene and pleasant morning. I observed, however, that the ridges nearest to the volcano were covered with mist, which I supposed to be the smoke of some house that might have been on fire in the night. But at eight o'clock the volcano began suddenly to emit a thick column of stones, sand, and ashes, which, with the greatest velocity, was elevated into the highest regions of the atmosphere. At this sight we were filled with the utmost dread, especially when we observed that in an instant the brow of the volcano was quite covered. We had never seen a similar eruption, but were convinced that a river of fire was flowing towards us, and was about to consume us. The first thing which was done in my village was to secure *the holy sacrament from profanation!* we then betook ourselves to flight. The swiftness with which the dreadful tide rolled towards us, did not give us time either for reflection or consultation. The frightful noise

of the volcano caused great terror even in the stoutest hearts. We all ran, filled with dismay and consternation, endeavouring to reach the highest and most distant places, to preserve ourselves from so imminent a danger. The horizon began to darken, and our anxieties redoubled. The noise of the volcano continually increased, the darkness augmented, and we continued our flight. But, notwithstanding our swiftness, we were overtaken by a heavy shower of huge stones, by the violence of which many unfortunate persons were in a moment killed. This cruel circumstance obliged us to make a pause in our career, and to shelter ourselves under the houses; but the flames and burnt stones which fell from above, in a short time reduced them to ashes.

The sky was now completely overcast, and we remained enveloped and immersed in a thick and palpable darkness. From that moment reflection was at an end. The mother abandoned her children, the husband his wife, and the children forgot their parents.

In the houses we had no longer any shelter. It was necessary to abandon, or perish with, them; yet, to go out uncovered, was to expose one's self to a danger not less imminent, because many of the stones were of an enormous size, and they fell as thick as drops of rain. It was necessary to defend ourselves as well as we could. Some covered themselves with hides, others with tables and chairs, and others with boards and tea-trays. Many took refuge in the trunks of trees, others among the canes and hedges, and some hid themselves in a cave, when the brow of a mountain protected them.

About ten o'clock the heavy stones ceased to fall, and a rain of thick sand succeeded. At half past one the noise of the volcano began to diminish, and the horizon to clear a little; and at two it became quite tranquil; and we now began to perceive the dreadful ravages which the darkness had hitherto concealed from us. The ground was covered with dead bodies, part of whom had been killed by the stones, and the others consumed by the fire. Two hundred perished in the church of Budiao, and thirty-five in a single house in that village. The joy the living felt at having preserved themselves, was in many converted into the extremity of sorrow at finding themselves deprived of their relations and friends. Fathers found their children dead,

husbands their wives, and wives their husbands, in the village of Budiao, where there were very few who had not lost some of their nearest connexions. In other places we found many persons extended upon the ground, wounded or bruised in a thousand ways. Some with their legs broken, some without arms, some with their sculls fractured, and others covered with wounds. Many died immediately, others on the following days, and the rest were abandoned to the most melancholy fate, without physicians, without medicines, and in want even of necessary food.

Five populous towns were entirely destroyed by the eruption; more than twelve hundred of the inhabitants perished amidst the ruins; and the twenty thousand who survived the awful catastrophe, were stripped of their possessions and reduced to beggary.

The subsequent appearance of the volcanic mountain was most melancholy and terrific. Its side, formerly so well cultivated, and which afforded a prospect the most picturesque, is now become a barren sand. The stones, sand, and ashes, which cover it, in some places exceed the depth of ten and twelve yards; and on the ground where lately stood the village of Budiao, there are spots, in which the cocoa-trees are almost covered. In the ruined villages, and through the whole extent of the eruption, the ground remains buried in the sand to the depth of half a yard, and scarcely a single tree is left alive. The crater of the volcano has lowered more than one hundred and twenty feet; and the south side discovers a spacious and horrid mouth, which is frightful to the view. Three new ones have opened at a considerable distance from the principal crater, through which also smoke and ashes are incessantly emitted. In short, the most beautiful villages of Camarines, and the principal part of that fine province, are deeply covered with barren sand.

ISLANDS WHICH HAVE RISEN FROM THE SEA.

Beside the convulsions of nature displayed in volcanoes, the most remarkable particulars of which we have given in our history of mountains, other operations are carried on below the fathomless depths of the sea, the nature of which