PHILOSOPHICAL TRANSACTIONS.

I. *An Account of a Journey to Mount* Etna, *in a Letter from the Honourable* William Hamilton, *His Majesty's Envoy Extraordinary at* Naples, *to* Mathew Maty, M. D. *Sec.* R. S.

SIR, Naples, Oct. 17, 1769.

Read Jan. 18, 1770. ENCOURAGED by the assurances you give me, in your last obliging letter of the 15th of June, that any new communication upon the subject of volcano's would be received with satisfaction by the Royal Society, I venture to send you the following account of my late observations upon Mount Etna, which you are at liberty to lay before our respectable Society, should you think it worth its notice.

After having examined with much attention the operations of Mount Veſuvius, during the five years, that I have had the honour of reſiding as his majeſty's miniſter at this court, and after having carefully remarked the nature of the ſoil for fifteen miles round this capital, I am, in my own mind, well convinced, that the whole of it has been formed by exploſion. Many of the craters, from whence this matter has iſſued, are ſtill viſible; ſuch as the Salfaterra near Puzzole, the lake of Agnano, and near this lake a mountain compoſed of burnt matter, that has a very large crater ſurrounded with a wall to incloſe the wild boars, and deer, that are kept there for the diverſion of his Sicilian majeſty; it is called Aſtruni: the Monte Nuovo thrown up from the bottom of the lucrine lake in the year 1538, which has likewiſe its crater, and the lake of Averno. The iſlands of Niſida and Procida are entirely compoſed of burnt matter; the iſland of Iſchia is likewiſe compoſed of lava, pumice, and burnt matter; and there are in that iſland ſeveral viſible craters, from one of which, no longer ago than the year 1303, there iſſued a lava which ran into the ſea, and is ſtill in the ſame barren ſtate as the modern lavas of Veſuvius. After having, I ſay, been accuſtomed to theſe obſervations, I was well prepared to viſit the moſt ancient, and perhaps the moſt conſiderable volcano that exiſts; and I had the ſatisfaction of being thoroughly convinced there, of the formation of very conſiderable mountains by meer exploſion, having ſeen many ſuch on the ſides of Etna, as will be related hereafter.

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On the 24th of June laſt, in the afternoon, I left Catania, a town ſituated at the foot of mount Etna, or as it is now called Mon Gibello, in company with lord Fortroſe and the canonico Recupero, an ingenious prieſt of Catania, who is the only perſon there, that is acquainted with the mountain: he is actually employed in writing its natural hiſtory, but I fear will not be able to compaſs ſo great and uſeful an undertaking, for want of proper encouragement.

We paſſed through the inferior diſtrict of the mountain called by its inhabitants La Regione Piemonteſe. It is well watered, exceedingly fertile and abounding with vines, and other fruit trees, where the lava, or, as it is called there, the Sciara, has had time to ſoften and gather ſoil ſufficient for vegetation, which I am convinced from many obſervations, unleſs aſſiſted by art, does not come to paſs for many ages, perhaps a thouſand years or more; the circuit of this lower region, forming the baſis of the great volcano, is upwards of one hundred Italian miles. The vines of Etna are kept low, quite the reverſe of thoſe on the borders of Veſuvius, and they produce a ſtronger wine, but not in ſo great abundance. The Piemonteſe diſtrict is covered with towns, villages, monaſteries, &c. and is well peopled, notwithſtanding the danger of ſuch a ſituation. Catania, ſo often deſtroyed by eruptions of Etna, and totally overthrown by an earthquake towards the end of the laſt century, has been re-built within theſe fifty years, and is now a conſiderable town, with at leaſt thirty-five thouſand inhabitants. I do not wonder at the ſeeming ſecurity, with which theſe parts are inhabited, having been ſo long witneſs to the ſame near mount

Veſuvius. The operations of nature are ſlow; great eruptions do not frequently happen, each flatters himſelf it will not happen in his time, or if it ſhould, that his tutelar ſaint will turn away the deſtructive lava from his grounds; then indeed the great fertility in the neighbourhoods of volcanos tempts people to inhabit them.

In about four hours of gradual aſcent we arrived at a little convent of benedictine monks, called St. Nicolo dell' Arena, about thirteen miles from Catania, and within a mile of the volcano from whence iſſued the laſt very great eruption in the year 1669, a circumſtantial account of which was ſent to our court by a lord Winchelſea, who happened to be then at Catania in his way home, from his embaſſy at Conſtantinople. His lordſhip's account is curious, and was printed in London ſoon after; I ſaw a copy of it at Palermo, in the library of the prince Torremuzzo *. We ſlept in the benedictines convent

* It is intituled, A true and exact Relation of the late prodigious Earthquake and Eruption of Mount Ætna, or Monte Gibello; as it came in a letter written to his majeſty from Naples, by the right honourable the earl of Winchelſea, his majeſty's late ambaſſador at Conſtantinople, who in his return from thence, viſiting Catania in the iſland of Sicily, was an eye-witneſs of that dreadful ſpectacle; together with a more particular narrative of the ſame, as it is collected out of the ſeveral relations ſent from Catania; publiſhed by authority. Printed by T. Newcomb, in the Savoy, 1669, p. 38.

" I accepted, ſays the author, the invitation of the biſhop of " Catania to ſtay a day with him, that ſo I might be the better " able to inform your majeſty of that extraordinary fire, which " comes from Mount Gibel, 15 miles diſtant from that city, " which, for its horridneſs in the aſpect, for the vaſt quantity " thereof (for it is 15 miles in length, and 7 in breadth), for its

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the night of the 24th, and paſſed the next morning in obſerving the ravage made by the abovementioned terrible eruption, over the rich country of the Piemonteſe. The lava burſt out of a vineyard within

" monſtrous devaſtation and quick progreſs, may be termed an " inundation of fire, a flood of fire, cinders, and burning ſtones, " burning with that rage as to advance into the ſea 600 yards, " and that to a mile in breadth, which I ſaw; and that which " did augment my admiration was, to ſee in the ſea this matter " like ragged rocks, burning in four fathom water, two fathom " higher than the ſea itſelf, ſome parts liquid, and throwing off, " not with great violence, the ſtones about it, which like a cruſt " of a vaſt bigneſs, and red hot, fell into the ſea every moment, " in ſome place or other, cauſing a great and horrible noiſe, " ſmoak, and hiſſing in the ſea; and that more and more coming " after it, making a firm foundation in the ſea itſelf. I ſtayed " there from 9 a clock on Saturday morning, to ſeven next " morning" (this muſt have been towards the middle or latter end of April); " and this mountain of fire and ſtones with " cinders, had advanced into the ſea 20 yards at leaſt, in ſeveral " places; in the middle of this fire, which burnt in the ſea, " it hath formed like to a river, with its banks on each ſide very " ſteep and craggy, and in this channel moves the greateſt " quantity of this fire, which is the moſt liquid, with ſtones " of the ſame compoſition, and cinders all red hot, ſwimming " upon the fire of a great magnitude; from this river of fire " doth proceed under the great maſſe of the ſtones, which are " generally three fathoms high all over the country, where it " burns, and in other places much more. There are ſecret con- " duits or rivulets of this liquid matter, which communicates " fire and heat into all parts more or leſs, and melts the ſtones " and cinders by fits in thoſe places where it toucheth them, " over and over again; where it meets with rocks or houſes " of the ſame matter (as many are), they melt and go away " with the fire; where they find other compoſitions, they turn " them to lime or aſhes (as I am informed). The compoſition " of this fire, ſtones and cinders, are ſulphur, nitre, quick- " ſilver, ſal ammoniac, lead, iron, braſs, and all other metals. " It moves not regularly, nor conſtantly down hill; in

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a mile of St. Nicolo', and by frequent exploſions of ſtones and aſhes, raiſed there a mountain, which, as near as I can judge, having aſcended it, is not leſs than half a mile perpendicular in height, and is certainly at leaſt three miles in circumference at its

" ſome places it hath made the valleys hills, and the hills " that are not high are now valleys. When it was night, I " went upon two towers, in divers places, and could plainly ſee " at ten miles diſtance, as we judged, the fire to begin to run " from the mountain in a direct line, the flame to aſcend as " high and as big as one of the greateſt ſteeples in your ma- " jeſty's kingdoms, and to throw up great ſtones into the air; I " could diſcern the river of fire to deſcend the mountain of a " terrible fiery or red colour, and ſtones of a paler red to ſwim " thereon, and to be ſome as big as an ordinary table. We could " ſee this fire to move in ſeveral other places, and all the coun- " try covered with fire, aſcending with great flames, in many " places, ſmoaking like to a violent furnace of iron melted, " making a noiſe with the great pieces that fell, eſpecially thoſe " which fell into the ſea. A cavalier of Malta, who lives there, " and attended me, told me, that the river was as liquid where " it iſſues out of the mountain, as water, and came out like a " torrent with great violence, and is five or ſix fathom deep, " and as broad, and that no ſtones ſink therein. I aſſure your " majeſty, no pen can expreſs how terrible it is, nor can all " the art and induſtry of the world quench or divert that which " is burning in the country. In 40 days time it hath deſtroyed " the habitations of 27,000 perſons, made two hills of one, " 1000 paces high apiece, and one is four miles in compaſs; " of 20,000 perſons, which inhabit Catania, 3000 did only re- " main; all their goods are carried away, the cannons of braſs " are removed out of the caſtle, ſome great bells taken down, " the city-gates walled up next the fire, and preparations made " to abandon the city.

" That night which I lay there, it rained aſhes all over the " city, and ten miles at ſea it troubled my eyes. This fire in " its progreſs met with a lake of four miles in compaſs, and it " was not only ſatisfied to fill it up, though it was four fathom " deep, but hath made of it a mountain."

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baſis. The lava that ran from it, and on which there are as yet no ſigns of vegetation, is fourteen miles in length, and in many parts ſix in breadth; it reached Catania, and deſtroyed part of its walls, buried an amphitheatre, an aqueduct, and many other monuments of its ancient grandeur, which, till then, had reſiſted the hand of time; and ran a conſiderable length into the ſea, ſo as to have once formed a beautiful and ſafe harbour; but it was ſoon after filled up by a freſh torrent of the ſame inflamed matter, a circumſtance the Catanians lament to this day, as they are without a port. There has been no ſuch eruption ſince, though there are ſigns of many, more terrible, that have preceded it.

For two or three miles round the mountain raiſed by this eruption, all is barren, and covered with aſhes; this ground, as well as the mountain itſelf, will in time certainly be as fertile as many other mountains in its neighbourhood, that have been likewiſe formed by exploſion. If the dates of theſe exploſions could be aſcertained, it would be very curious, and mark the progreſs of time with reſpect to the return of vegetation, as the mountains raiſed by them are in different ſtates; thoſe (which I imagine to be the moſt modern) are covered with aſhes only; others of an older date, with ſmall plants and herbs, and the moſt antient, with the largeſt timber trees I ever ſaw; but I believe the latter are ſo very ancient, as to be far out of the reach of hiſtory. At the foot of the mountain raiſed by the eruption of the year 1669, there is a hole, through which, by means of a rope, we deſcended into ſeveral ſubterraneous caverns, branching out and extending much farther

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and deeper than we choſe to venture, the cold there being exceſſive, and a violent wind frequently extinguiſhing ſome of our torches. Theſe caverns undoubtedly contained the lava that iſſued forth and extended, as I ſaid before, quite to Catania. There are many of theſe ſubterraneous cavities known, on other parts of Etna; ſuch as that, called by the peaſants, La Baracca Vecchia, another La Spelonca della Palomba (from the wild pidgeons building their neſts therein), and the cavern Thalia, mentioned by Boccaccio. Some of them are made uſe of as magazines for ſnow; the whole iſland of Sicily and Malta being ſupplied with this eſſential article (in a hot climate) from mount Etna; many more would be found, I dare ſay, if ſearched for, particularly near and under the craters from whence great lavas have iſſued, as the immenſe quantities of ſuch matter we ſee above ground muſt neceſſarily ſuppoſe very great hollows underneath.

After having paſſed the morning of the 25th in theſe obſervations, we proceeded through the ſecond, or middle region of Etna, called La Selvoſa, the woody, than which nothing can be more beautiful. On every ſide are mountains, or fragments of mountains, that have been thrown up by various ancient exploſions; there are ſome near as high as mount Veſuvius, one in particular, (as the canon our guide aſſured me, having meaſured it) is little leſs than one mile in perpendicular heighth, and five in circumference at its baſis. They are all more or leſs covered, even within their craters, as well as the rich valleys between them, with the largeſt oak, cheſnut, and firr trees, I every ſaw any where; and indeed

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it is from hence chiefly, that his Sicilian majeſty's dock-yards are ſupplied with timber. As this part of Etna was famous for its timber in the time of the tyrants of Syracuſa, and as it requires the great length of time I have already mentioned before the matter is fit for vegetation, we may conceive the great age of this reſpectable volcano. The cheſnut-trees predominated in the parts through which we paſſed, and, though of a very great ſize, are not to be compared to ſome on another part of the Regione Selvoſa, called Carpinetto. I have been told by many, and particularly by our guide, who had meaſured the largeſt there, called La Caſtagna di Cento Cavalli, that it is upwards of twenty-eight Neapolitan canes in circumference. Now as a Neapolitan cane is two yards and half a quarter, Engliſh meaſure, you may judge, ſir, of the immenſe ſize of this famous tree. It is hollow from age, but there is another near it almoſt as large and ſound; as it would have required a journey of two days to have viſited this extraordinary tree, and the weather being already very hot, I did not ſee it. It is amazing to me that trees ſhould flouriſh in ſo ſhallow a ſoil, for they cannot penetrate deep without meeting with a rock of lava, and indeed great part of the roots of the large trees we paſſed by are above ground, and have acquired, by the impreſſion of the air, a bark like that of their branches. In this part of the mountain, are the fineſt horned cattle in Sicily; we remarked in general that the horns of the Sicilian cattle are near twice the ſize of any we had ever ſeen; the cattle themſelves are of the common ſize. We paſſed by the lava of the laſt eruption in the year

1766, which has deſtroyed above four miles ſquare of the beautiful wood abovementioned. The mountain raiſed by this eruption abounds with ſulphur and ſalts, exactly reſembling thoſe of Veſuvius, ſpecimens of which I ſent ſome time ago to the late lord Morton.

In about five hours from the time we had left the convent of St. Nicolo dell' Arena, we arrived at the borders of the third region, called La Netta, or Scoperta, clean or uncovered, where we found a very ſharp air indeed; ſo that in the ſame day, the four ſeaſons of the year were ſenſibly felt by us, on this mountain; exceſſive ſummer heats in the Piemonteſe, ſpring and autumn temperature in the middle, and extreme cold of winter in the upper region. I could perceive, as we approached the latter, a gradual decreaſe of vegetation, and from large timber trees we came to the ſmaller ſhrubs and plants of the northern climates; I obſerved quantities of juniper and tanzey; our guide told us, that later in the ſeaſon there are numberleſs curious plants here, and that in ſome parts there are rhubarb and ſaffron in plenty. In Carrera's hiſtory of Catania, there is a liſt of all the plants and herbs of Etna, in alphabetical order.

Night coming on, we here pitched a tent and made a good fire, which was very neceſſary, for without it, and very warm cloathing, we ſhould ſurely have periſhed with cold; and at one of the clock in the morning of the 26th, we purſued our journey towards the great crater. We paſſed over valleys of ſnow that never melts, except there is an eruption of lava from the upper crater, which ſcarcely ever happens; the great eruptions are uſually

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from the middle region, the inflamed matter finding (as I ſuppoſe) its paſſage through ſome weak part, long before it can riſe to the exceſſive height of the upper region, the great mouth on the ſummit only ſerving as a common chimney to the volcano. In many places the ſnow is covered with a bed of aſhes, thrown out of the crater, and the ſun melting it in ſome parts makes this ground treacherous; but as we had with us, beſides our guide, a peaſant well accuſtomed to theſe valleys, we arrived ſafe at the foot of the little mountain of aſhes that crowns Etna, about an hour before the riſing of the ſun. This mountain is ſituated in a gently inclining plain, of about nine miles in circumference; it is about a quarter of a mile perpendicular in height, very ſteep, but not quite ſo ſteep as Veſuvius; it has been thrown up within theſe twenty-five or thirty years, as many people at Catania have told me they remembered when there was only a large chaſm or crater, in the midſt of the abovementioned plain. Till now the aſcent had been ſo gradual (for the top of Etna is not leſs than thirty miles from Catania, from whence the aſcent begins) as not to have been the leaſt fatiguing; and if it had not been for the ſnow, we might have rode upon our mules to the very foot of the little mountain, higher than which the canon our guide had never been: but as I ſaw that this little mountain was compoſed in the ſame manner as the top of Veſuvius, which, notwithſtanding the ſmoak iſſuing from every pore, is ſolid and firm, I made no ſcruple of going up to the edge of the crater, and my companions followed. The ſteep aſcent, the keenneſs of the air, the vapours of the

ſulphur, and the violence of the wind, which obliged us ſeveral times to throw ourſelves flat upon our faces to avoid being over-turned by it, made this latter part of our expedition rather inconvenient and diſagreeable. Our guide, by way of comfort, aſſured us that there was generally much more wind in the upper region at this time.

Soon after we had ſeated ourſelves on the higheſt point of Etna, the ſun aroſe and diſplayed a ſcene that indeed paſſes all deſcription. The horizon lighting up by degrees, we diſcovered the greateſt part of Calabria, and the ſea on the other ſide of it; the Phare of Meſſina, the Lipari Iſlands, Stromboli with its ſmoaking top, though at above ſeventy miles diſtance, ſeemed to be juſt under our feet; we ſaw the whole iſland of Sicily, its rivers, towns, harbours, &c. as if we had been looking on a map. The iſland of Malta is low ground, and there was a hazineſs in that part of the horizon, ſo that we could not diſcern it; our guide aſſured us he had ſeen it diſtinctly at other times, which I can believe, as in other parts of the horizon, that were not hazy, we ſaw to a much greater diſtance; beſides, we had a clear view of Etna's top from our ſhip as we were going into the mouth of the harbour of Malta ſome weeks before; in ſhort, as I have ſince meaſured on a good chart, we took in at one view a circle of above nine hundred Engliſh miles. The pyramidal ſhadow of the mountain reached acroſs the whole iſland and far into the ſea on the other ſide. I counted from hence forty-four little mountains (little I call them in compariſon of their mother Etna, though they would appear great any where elſe) in the middle region on the Ca-

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tania ſide, and many others on the other ſide of the mountain, all of a conical form, and each having its crater; many with timber trees flouriſhing both within and without their craters. The points of thoſe mountains, that I imagine to be the moſt ancient, are blunted, and the craters of courſe more extenſive and leſs deep than thoſe of the mountains formed by exploſions of a later date, and which preſerve their pyramidal form entire. Some have been ſo far mouldered down by time as to have no other appearance of a crater than a ſort of dimple or hollow on their rounded tops, others with only half or a third part of their cone ſtanding; the parts that are wanting having mouldered down, or perhaps been detached from them by earthquakes, which are here very frequent. All however have been evidently raiſed by exploſion; and I believe, upon examination, many of the whimſical ſhapes of mountains in other parts of the world would prove to have been occaſioned by the ſame natural operations. I obſerved that theſe mountains were generally in lines or ridges; they have moſtly a fracture on one ſide, the ſame as in the little mountains raiſed by exploſion on the ſides of Veſuvius, of which there are eight or nine. This fracture is occaſioned by the lava's forcing its way out, which operation I have deſcribed in my account of the laſt eruption of Veſuvius. Whenever I ſhall meet with a mountain, in any part of the world, whoſe form is regularly conical, with a hollow crater on its top, and one ſide broken, I ſhall be apt to decide ſuch a mountain's having been formed by an eruption, as both on Etna and Veſuvius the mountains formed by exploſion

exploſion are without exception according to this deſcription; but to return to my narrative.

After having feaſted our eyes with the glorious proſpect above-mentioned (for which, as Spartian tells us, the emperor Adrian was at the trouble of aſcending Etna), we looked into the great crater, which, as near as we could judge, is about two miles and a half in circumference; we did not think it ſafe to go round and meaſure it, as ſome parts ſeemed to be very tender ground. The inſide of the crater, which is incruſted with ſalts and ſulphurs like that of Veſuvius, is in the form of an inverted hollow cone, and its depth nearly anſwers to the height of the little mountain that crowns the great volcano. The ſmoak, iſſuing abundantly from the ſides and bottom, prevented our ſeeing quite down; but the wind clearing away the ſmoak from time to time, I ſaw this inverted cone contracted almoſt to a point; and, from repeated obſervations, I dare ſay, that in all volcanos, the depth of the craters will be found to correſpond nearly to the height of the conical mountains of cinders which uſually crown them: in ſhort, I look upon the cratersas a ſort of ſuſpended funnels, under which are vaſt caverns and abyſſes. The formation of ſuch conical mountains with their craters are eaſily accounted for, by the fall of the ſtones, cinders, and aſhes, emitted at the time of an eruption.

The ſmoak of Etna, though very ſulphureous, did not appear to me ſo fetid and diſagreeable as that of Veſuvius; but our guide told me that its quality varies, as I know that of Veſuvius does, according to

to the quality of the matter then in motion within. The air was ſo very pure and keen in the whole upper region of Etna, and particularly in the moſt elevated parts of it, that we had a difficulty in reſpiration, and that, independent of the ſulphureous vapour. I brought two barometers and a thermometer with me from Naples, intending to have left one with a perſon at the foot of the mountain, whilſt we made our obſervations with the other, at ſun riſing, on the ſummit; but one barometer was unluckily ſpoilt at ſea, and I could find no one expert enough at Catania to repair it; what is extraordinary, I do not recollect having ſeen a barometer in any part of Sicily. At the foot of Etna, the 24th, when we made our firſt obſervation, the quickſilver ſtood at 27 degrees 4 lines, and the 26th, at the moſt elevated point of the volcano, it was at 18 degrees 10 lines. The thermometer, on the firſt obſervation at the foot of the mountain was at 84 degrees, and on the ſecond at the crater at 56. The weather had not changed in any reſpect, and was equally fine and clear, the 24th and 26th. We found it difficult to manage our barometer in the extreme cold and high wind on the top of Etna; but from the moſt exact obſervations we could make, in our circumſtances, the reſult was as abovementioned. The canon aſſured me, that the perpendicular height of mount Etna is ſomething more than three Italian miles, and I verily believe it is ſo.

After having paſſed at leaſt three hours on the crater, we deſcended and went to a riſing ground, about a mile diſtant from the upper mountain we had juſt left, and ſaw there ſome remains of the foundation

dation of an ancient building; it is of brick, and ſeems to have been ornamented with white marble, many fragments of which are ſcattered about. It is called the Philoſopher's Tower, and is ſaid to have been inhabited by Empedocles. As the ancients uſed to ſacrifice to the celeſtial gods on the top of Etna, it may very well be the ruin of a temple that ſerved for that purpoſe. From hence we went a little further over the inclined plain abovementioned, and ſaw the evident marks of a dreadful torrent of hot water that came out of the great crater at the time of an eruption of lava in the year 1755, and upon which phænomenon the canonico Recupero, our guide, has publiſhed a diſſertation. Luckily this torrent did not take its courſe over the inhabited parts of the mountain, as a like accident on mount Veſuvius in 1631 ſwept away ſome towns and villages in its neighbourhood, with thouſands of their inhabitants. The common received opinion is, that theſe eruptions of water proceed from the volcanos having a communication with the ſea; but I rather believe them to proceed merely from depoſitions of rain water in ſome of the inward cavities of them. We likewiſe ſaw from hence the whole courſe of an ancient lava, the moſt conſiderable as to its extent of any known here; it ran into the ſea near Taormina, which is not leſs than thirty miles from the crater whence it iſſued, and is in many parts fifteen miles in breadth. As the lavas of Etna are very commonly fifteen and twenty miles in length, ſix or ſeven in breadth, and fifty feet or more in depth, you may judge, ſir, of the prodigious quantities of matter emitted in a great eruption

eruption of this mountain, and of the vaſt cavities there muſt neceſſarily be within its bowels. The moſt extenſive lavas of Veſuvius do not exceed ſeven miles in length; the operations of nature on the one mountain and the other are certainly the ſame; but on mount Etna, all are upon a great ſcale. As to the nature and quality of their lavas, they are much the ſame; but I think thoſe of Etna rather blacker, and in general more porous, than thoſe of Veſuvius. In the parts of Etna that we went over I ſaw no ſtratas of pumice ſtones, which are frequent near Veſuvius, and cover the ancient city of Pompeia; but our guide told us, that there are ſuch in other parts of the mountain. I ſaw ſome ſtratas of what is called here Tuffa, it is the ſame that covers Herculaneum, and that compoſes moſt of the high grounds about Naples; it is upon examination a mixture of ſmall pumice ſtones, aſhes, and fragments of lava, which is by time hardened into a ſort of ſtone. In ſhort I found, with reſpect to the matter erupted, nothing on mount Etna that Veſuvius does not produce, and there certainly is a much greater variety in the erupted matter and lavas of the latter, than of the former; both abound with pyrites and cryſtallizations, or rather vitrifications. The ſea ſhore at the foot of Etna, indeed, abounds with amber, of which there is none found at the foot of Veſuvius. At preſent there is a much greater quantity of ſulphur and ſalts on the top of Veſuvius than on that of Etna; but this circumſtance varies according to the degree of fermentation within, and our guide aſſured me he had ſeen greater quantities on Etna at other times. In our way back to Catania, the canon ſhewed me a

little hill covered with vines, which belonged to the jeſuits, and, as is well atteſted, was undermined by the lava in the year 1669, and tranſported half a mile from the place where it ſtood, without having damaged the vines.

In great eruptions of Etna, the ſame ſort of lightening, as deſcribed in my account of the laſt eruption of Veſuvius, has been frequently ſeen to iſſue from the ſmoak of its great crater. The ancients took notice of the ſame phænomenon, for Seneca (lib. ii. Quæſt. Nat.) ſays,—" Ætna aliquando multo igne " abundavit, ingentem vim arenæ urentis effudit, " involutus eſt dies pulvere, populoſque ſubita nox " terruit, *illo tempore aiunt plurima fuiſſe tonitrua et " fulmina.*"

Till the year 252 of Chriſt, the chronological accounts of the eruptions of Etna are very imperfect; but as the veil of St. Agatha was in that year firſt oppoſed to check the violence of the torrents of lava, and has ever ſince been produced at the time of great eruptions, the miracles attributed to its influence having been carefully recorded by the prieſts, have at leaſt preſerved the dates of ſuch eruptions. The relicks of St. Januarius have rendered the ſame ſervice to the lovers of natural hiſtory, by recording the great eruptions of Veſuvius. I find, by the dates of the eruptions of Etna, that it is as irregular and uncertain in its operations as Veſuvius. The laſt eruption was in 1766.

On our return from Meſſina to Naples, we were becalmed three days in the midſt of the Lipari Iſlands, by which we had an opportunity of ſeeing that they have all been evidently formed by exploſion; one of them,

them, called Vulcano, is in the ſame ſtate as the Solfaterra. Stromboli is a volcano, exiſting in all its force, and, in its form of courſe, is the moſt pyramidal of all the Lipari Iſlands; we ſaw it throw up red hot ſtones from its crater frequently, and ſome ſmall ſtreams of lava iſſued from its ſide, and ran into the ſea. This volcano differs from Etna and Veſuvius, by its continually emitting fire, and ſeldom any lava; notwithſtanding its continual exploſions, this iſland is inhabited, on one ſide, by about an hundred families.

Theſe, as well as I can recollect, are all the obſervations that I made with reſpect to volcanos, in my late curious tour of Sicily; and I ſhall be very happy ſhould the communication of them afford you, or any of our countrymen (lovers of natural hiſtory), ſatisfaction or entertainment.

I am, ſir,

with great regard and eſteem,

your moſt obedient

humble ſervant,

Wm. Hamilton.