

C H A P. VI.

FROM BUDE TO GYONGYES—MATRA MOUNTAINS AND THEIR
FOSSILS—ALUM WORKS—PSEUDO-VOLCANIC CRATER—CURI-
OUS PITCH STONE—VOLCANIC TUSA.

THE hopes of finding an extinct volcano in the Matra, where Mr. Fichtel very boldly has asserted one to have been lately found, made me readily accept of an invitation from Baron Joseph Orcy, who has a very large farm and manufactory of alum amongst these mountains, to come and pass a day or two with him there; and the specimen of real volcanic *tusa* which I had lately seen, heightened my ardour in the pursuit of this volcano, and made me leave my good and hospitable friends at Bude less reluctantly. But Hainotzy, honest Hainotzy, what sad misfortune has befallen you since our late convivial parties? It is not true that you conspired against the state, and, envious of your superiors, planned their destruction; nor, imbibing the deluding spirit of the times, through mistaken patriotism rebelled against your sovereign. Rather to some cabal, by which honest men in turbulent times do often fall, I shall attribute your disaster; for plots of old, I know, were formed against you, and believe that you did not forfeit, but unjustly lose your life. Then will I be your
friend,

friend, and, when occasion offers, vindicate your memory, and scratch your name out of the list of the destroyers of public felicity.

On Saturday, June 8th, I set off for Gyongyes; I travelled through a level country, pretty well cultivated, the soil sandy. The only things I noticed in this day's journey were the seat of Prince Grassalcovitz and the town of Hatvan. The palace of the prince is a vast pile of building, but in a situation not very favourable. He keeps his guards like Prince Esterhazy. I observed a few trifling hop-grounds hereabouts. Hatvan is said formerly to have been a very considerable town; it is now a very paltry one. In the walls of the church I noticed the breccia, so often mentioned to be used for building; and I found loose fragments of the same in several places. In this district there are very large pasture grounds, which feed great numbers of horses, and storks are very common; they build upon the ridges of the roofs of the peasants' cottages. As I was detained a good while at Hatvan for horses, I did not arrive at Gyongyes before it was dark: here I found a tolerable good inn, which was the more acceptable as I had scarce had any thing to eat since I left Bude.

As soon as I looked about me the next morning, I found I was at the foot of the hills or mountains of Matra; and seeing nothing used for building but the breccia, I was very anxious to examine them. Immediately after breakfast I ascended that branch
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which lies immediately above the town. I walked for a long time through nothing but vineyards, which extended above half way up the hill; here I found only small loose fragments, and now and then large blocks of this breccia*: higher up I found it forming firm rocks. In other parts nothing but the decomposed Porphyry or *Saxum metalliferum* was to be seen. The solid rock was too seldom laid bare to enable me to say which of these two kinds of rocks forms the greatest part of the hill, and, what is of more importance, what is their relative situation to one another: as far as my few observations extend, the breccia is the most general. Yet this may only be a superficial covering to the porphyry.

Near the top I had the good fortune to find a great deal of *Müller-glass*, or Lava glass, *Olivinus vitreus*. It covered one side of several small loose blocks of a porous kind of Porphyry †, such as would be called by the volcanists porphyritic lava. These blocks in some places were piled one upon another to form a wall or fence. I detached some most beautiful specimens, much superior to any I have seen from the neighbourhood of Frankfort. This fossil, in my opinion, has been sadly mistaken, and geognostic theories are

* Ex fragmentis mediocribus & minoribus argillæ induratæ fuscæ omnino terram coctam referentis, angulis integris, & porphyrii cellulosi fusci ope massæ heterogenæ terreæ griseo-rubescens, conglutinatis.

† Porphyrius

Fuscus aut nigricans cellulofus, cellulis parvis; ex basalte feldspato albido diaphano infarcto.

in part the cause of the error. The *Vulcanists* having ranged it amongst the productions of fire, consider it as a melted body, as a volcanic glass; and their antagonists the *Neptunists* consider it as a Calcedony. Mr. Born, speaking of that found near Francfort, though he acknowledges the stone to which it adheres to be volcanic, says, “*On la nomme improprement verre volcanique.*” Mr. Suckow, in his excellent Compendium of Mineralogy, places it amongst the volcanic glasses. Professor Blumenbach places it in his Compendium of Natural History likewise under the head of Volcanic glasses, and adds that it is probably formed from melted zeolite. The learned Professor Gmelin in his edition of the Syst. Nat. places it under the genus *Olivinus*, and calls it *Olivinus vitreus*. Mr. Stütz in his Catalogue of the Imperial Collection, who has very judiciously excluded, in the classification of Fossils, the consideration of the means of their formation, and has consequently suppressed the class, order, &c. of volcanic productions, has placed it with the *Obsidian*. Mr. Widenmann thinks it may be classed with the Calcedony, and quotes Mr. Links’ analysis, which he however acknowledges to differ very much from the analysis of the Calcedony; but never mentions Mr. Gerhard’s analysis, which approaches much nearer. Mr. Kirwan, in the late edition of his Mineralogy, following, as he says, Mr. Werner, has called it *Hyalite*. But he has erred I imagine in considering, with Mr. Widenmann, Mr. Links’ analysis and his characters of “being found *in* Basalt, or Trap, either in grains or in masses inclining to a rhomboidal form, or in filaments,” to belong to this

Fossil. These characters and the analysis I would rather suppose to belong to a transparent *Feldspar* or *Adularia* found in some kinds of Basalt or Trap. The component parts as given in this analysis, ought to form a very fusible body; but Mr. Kirwan acknowledges it to be infusible at 150 deg. My opinion is, that those who have considered it to be a Calcedony have come nearest the truth; without venturing, however, to make any objection to the denomination and opinion of Mr. Werner, of which I know nothing, but through Mr. Kirwan's Mineralogy. But my specimens induce me to place it where no one yet has referred it, that is, with the Quartz; as it has not the fracture and transparency of Calcedony, but of Rock Crystal; and the analysis of Mr. Gerhard, in Crell's Chemical Annals*, which shows it to contain only a fiftieth part of Argill, agrees with this classification: these are likewise the component parts of an infusible body: I therefore shall denominate it *Quartzum tuberculatum* †. The effects of fire on this curious fossil are very remarkable and interesting; it destroys its transparency, and makes it fragile, but gives it a beautiful white pearly lustre; and in this state it is plainly seen to be composed of many intensely thin beds covering one another, as in stalagmitical fossils. Are not these successive layers an argument against its being a melted mass, a volcanic production?

* For 1785, I. p. 57.

† *Quartzum tuberculatum*.

Hyalinum, superficiebus tuberculosis tuberculis confluentibus, incrustans,

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I could have spent many hours with pleasure on these hills; they afford fine extensive views, and are rich in vegetable productions and insects; but I had fixed my departure for Paräd immediately after dinner, and was therefore obliged to hasten down.

As the road to Paräd was over and amongst high hills, the Judge insisted, on bringing my horses, that I should pay for a double stage. As this is not customary, and I had reason to believe he meant to pocket the extra pay, and not to give it to the peasant my driver, I refused, and after I had abused him pretty freely he submitted. I fined him his dram. I had taken the precaution at Bude to provide myself with a *forespan* privilege, as I knew I should often be obliged to travel roads, where post-horses and such means of travelling were not to be had. This was like that I obtained at Ædinburgh, only it was in force through a greater extent of country, I think through two or three counties, and consequently a greater favour to obtain.

About two miles from Gyongyes, and not far from the road side, is the quarry from whence most of the stone which is used for the buildings of that town is taken. Some of the fragments of Porphyry are so cellular as to be quite a Scoria, but the Feldspar is still visible. A little further there are rocks of reddish brown Porphyry*. Soon after I en-

* Porphyrius

Ex Jaspide hepatica parum et exiliter cellulosa, particulis parvis albo-rubentibus Feldspati infarcta.

tered the Matra, a chain of mountains about forty miles in extent. I travelled up-hill and down-hill, on the most abominable road, for four or five hours, till I reached Paräd. I thought often my cart, for this was my vehicle, must have been broken in pieces. The rocks were composed of Porphyry, nearly similar to that I just mentioned, which is the kind that the Volcanists call porphyritic lava; and in one place I saw some coarse grained red sandstone. The hills were well covered with wood, principally with oaks, no firs. I received a hearty welcome from the Baron, and I spent two or three days with him in going over his estate and seeing his improvements. Hungary has few more active and intelligent œconomists than this nobleman, and few better patriots. Though his own landed property is very great, he has taken a lease of this estate from Prince Grassalcovitz, which, as may be supposed by the annual rent, is very extensive: the Baron pays 3,500l. a year.

The Alum Work which he has established, employs twenty or thirty hands. The alum is made from Iron Pyrites, which is dispersed through a decomposed Argillaceous Porphyry, or *Saxum metalliferum*, of which most of the rocks on this estate are composed. This is detached by gunpowder, then broken in pieces and laid in heaps in the open air to decompose: this takes place in the space of two or three months; then it is roasted: this operation lasts about a month: afterwards it is thrown into large wooden receivers with double bottoms, filled with water, which have spickets in the lower division to let off the impregnated water, which, after it is sufficiently strong

strong by remaining on fresh materials, is conveyed into leaden boilers to be evaporated, and from thence into the vessels, where it precipitates its iron, and afterwards it is crystallized. There is a similar, but smaller manufactory in the neighbourhood, belonging to a company.

With a view to turn the woods which are on this estate to some account, and there is not a sufficient demand for timber, the Baron has erected a glass-house upon it, as in Sweden iron forges are often established on estates, usefully to apply the produce of its forests: from this he clears about three hundred a-year. Coarse common glass is only made, which is blown chiefly into drinking-glasses, bottles, and window-glass.

The Baron has tried his fortune in mining, but he has not been successful: this is nothing uncommon. The vein is in a rock of *Saxum metalliferum*, and contains grey copper ore. There is likewise a spring of acidulous water on this estate, which, were it in a more populous country, would be a source of great revenue. I think I never saw a finer spring, not so much in regard to its quantity, as its quality.

He took me one day to see a natural curiosity, called the *Devil's Wall*. This I found to be nothing more than what is known in Scotland, where they are very common in some parts, under the name of
Whin.

Whin Dykes. I only saw it where it crosses a ravine; here it forms a *façade* of thirty feet or more in height. I was told that it extends several miles over the hills, but here it is much lower: on the back it is no ways remarkable. It owes its height, no doubt, to the washing away of the rocks through which it runs. It is composed of a Porphyritic Basaltes, a basalt in which the feldspar? is hardly distinguishable from the base, and is chiefly noticed by its shining. I found many loose blocks which approached nearer to Porphyry.

The *Lucanus Cervus* and *Cerambix Heros* are very common in these oak woods: this was the season of their amours. A male of the small variety of the first mentioned insect I found fulfilling the peremptory, yet pleasing command of Heaven, with a female of the ordinary size. As I was returning one afternoon on horseback with the Baron to Gyongyes over the Matra, a wolf crossed the road twice with great boldness, within forty yards of us; we halted till our servants, who had our guns, came up with us, but he did not make his appearance a third time: it was conjectured that he was after some young folds.

Near the road, and in the highest part of these hills, the pretended Crater of Mr. Fichtel, who has given a detailed account of it in the Memoirs of a Society of Naturalists at Berlin, is found. He announces the discovery with such certainty, that one might have expected, if not to see the flame and smoke, to find it still warm enough to toast cheese, or to broil a beef-steak. I was all expectation; for

though the present non-existence of craters by no means proves the non-existence of volcanoes in former times ; yet the present existence of one, one that could not be disputed from its similarity with the craters of indisputable volcanic countries, would be, to the most violent *Neptunist*, a sufficient proof : but this one may, I think, be objected to on sufficient grounds. It is not in a conical hill with a reversed conical cavity in the middle, as all those hills necessarily are which are formed by the ejection of loose fragments ; but it is a vast cavity, whose sides are composed of firm and solid rock. It is of an irregular oblong shape, and has a communication on one side, and in the direction of its greatest diameter, with an inferior valley : here the *Volcanists* say this side of the crater has fallen down, and is now only occupied by a current of lava. But I think it may with equal propriety be affirmed, that this communication is only the usual communication of one valley with another, and that the pretended current of lava is but the ruins of the rocks above ; and, had they not fallen, and in part blocked up this communication, there would have been little more reason for supposing this to be a crater, than many short deep valleys which are to be found in every chain of mountains. This valley, or crater, or whatever else it may be, is about half a mile in circumference, and in depth twice the height of an oak tree : at bottom it has several deep holes : in one there was still ice, though this was the 11th day of June. The whole is so overgrown with wood, that it is very difficult to form a just idea of the *ensemble* of it. No conjecture of a volcano's former existence in these hills will be confirmed,

firmed, I think, by the inspection of *this crater*; but Mr. Fichtel has greatly the advantage over me in boldly deciding on the subject, as he never saw it, and only obtained his account from a man who never trod the *Campi Phlegræi*, and from one who knew he was fond of volcanoes. But, as I have said, though the existence of a crater proves the former existence of a volcano, its non-existence proves nothing: they are of all volcanic remains the most easily destroyed; they are grand and decisive testimonies when found, but, like the stately pile, easily destroyed in the revolutions of Nature; whilst the more humble Pumex, like medals, however tost about, and to whatever remote corner of the globe it is transported, bears upon it still the marks of its origin.

When I returned to Gyongyes I took up my quarters with the Baron: he has, like most Hungarian Magnates, a great profusion of Hungarian dresses, arms, and smoking pipes, and a very fine orangery.

The *Mus Cricetus*, or German Marmot, which is generally said to collect, in summer, provision for the winter, and then to hibernate, the Baron assured me, frequents throughout the winter his barns, and does him a great deal of mischief. To avoid a mistake, I desired to see a skin of one, and I was shown a cloak entirely lined with them.

The price of labour here is, for men employed in the vineyards, when the days are short, about five-pence, and at this time of the year
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seven-pence. The common working men in the alum manufactory likewise received seven-pence a-day. They all find themselves; but the vine-dressers generally receive a dram and a bit of bread at the end of the day's work, gratis.

From hence I continued my route to Erlau, but accompanied the Baron to Compot, another estate he leases from Prince Grassalcovitz. On this farm he keeps a good many buffaloes. Their milk and butter are more esteemed here than those of cows, and they are said to give a greater quantity; yet the butter which I partook of was poor and white. But the bad quality of the butter and cheese of most countries in Europe arises more from the bad management of the dairy, than from any defect in the cattle or their pastures; and the produce of the dairy is in little esteem in all this part of the continent. The flesh of the young buffaloes is preferred to veal. I saw two about a fortnight old; they were as well covered with hair as our common calves, though when grown up they are almost bare. The granaries and cellars of this nobleman were very large and well stocked. Some of the tubs of wine, though not so big as the famed one of Heidelberg, were, I think, big enough to drown a dozen, or even a score, of full-grown and full-fed Aldermen in.

After dinner I took leave of my hospitable friend, and continued my route to Erlau; and he at the same time set off to see another estate. Through some intrigue, this nobleman fell into disgrace
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with the Emperor Leopold, who deprived him of the high post of lord lieutenant of a county which he then filled. When he gave in his resignation, he openly, but respectfully, told his sovereign, that if he stood in no need of his services, he stood in no need of his honours. His present majesty, knowing his worth, promised to give him another lord lieutenancy if he ever should become sovereign. He kept his word, and, soon after his ascent to the throne, made him lord lieutenant of the county of Zemplin. This is merely, as most charges in Hungary are, a post of honour, not of emolument. The usual salary is about a hundred a year, which is not sufficient to defray the expences of the entertainments, &c. given by him at the county meetings.

Near Compot is Débrew, famous for its tobacco. This generally sells 12 or 15 per cent. higher than any other Hungarian tobacco. The country from Gyongyes to Compot is well cultivated, and in corn land; and from thence to Erlau, corn land intermixed with woods. The leaves of the trees in this district were so destroyed by caterpillars, that they seemed as though they had not yet shot them out.

Two or three miles on this side of Erlau, the roads are mended with a very remarkable fossil. It is a *Pitch-stone* (*Pechstein*) quite like *Gneis* in its appearance, being composed of short streaks, or interrupted layers of black and white. Both of these are *Pitch-stone*, and readily intumesce

intumefce under the blow-pipe, and form a white ſcoria, as I have found ſome of the black Scotch *Pitch-ftones* to do. It contains a few hexangular ſpangles of black Mica, and a few grains of *Adularia* or transparent *Feldſpar*.

This probably is the very foſſil which induced Mr. Gerhard, who has been followed by Mr. Kirwan, to ſay, as a proof of the *Neptunic* origin of the *Obſidian*, that it is found in *Gneis*, &c. But as all is not gold that glitters, ſo all is not *Gneis* which is ſtreaked black and white. But Mr. Fichtel, whoſe *burning ardour* in mineralogy is well known, leaves all others far behind. When I returned from Hungary to Vienna, I gave this excellent man a ſpecimen of this very foſſil: and, not without reaſon, I was very much ſurprized a few months after to read in his *Mineralog. Aufſ.* page 314, the following account of it:

“ The ſecond example of *Granit altered by volcanic fire* is near Erlau, in the neighbourhood of the *old Volcano Matra*, where *Granit, more or leſs burnt*, is uſed for repairing the road. The *Quartz* has its granulated ſhape changed into an amorphous *melted maſs*. The black glimmer is in *part become hexangular*, and part has aſſumed a *melted amorphous appearance*; but the *Feldſpar* has *not ſuffered*, no part is zeolitic; therefore this *burnt Granit* ſtill belongs to its kind.”
Into what ſtrange errors do not theories often lead the beſt of men!
The *Quartz* is changed into a fuſible *Pitch-ftone*, the Mica is in part

crystallized, and in part turned into Pitch-stone, and the *Feldspar* remains *unaltered!!!* *Me Hercule*---No—I will rather be a plodding relater of facts through life, than give to the mineralogical world such *heated effusions of an inflamed fancy* for explanations. I saw the rock from whence this curious fossil was detached, as it was by the road side; but I could observe nothing more than that it formed a bed.

Just on entering Erlau, on both sides of the road there is nothing but volcanic *Tufa* *. On the right it forms a bank forty or fifty feet high: it contains a great deal of *pumex*. From the bank on the left hand I detached pieces as big as a man's head; more evident volcanic *Tufa* I never saw, not even in the *Campi Phlegæi*: some of the *pumex* is so little decomposed, that it might almost be used for technical purposes: it has retained its silky appearance, and swims on immersion in water; though after it has imbibed this fluid it sinks.

* *Cæmentum Tufa*.

Ex fragmentis mediocribus & minoribus Pumicis albi fibrosi, interdumque cinerei tamque magis vitrei, in massa dilute griseo-flavescente heterogenia terrea friabili aspera.