# XVI. *A Deſcription of a petrified Stratum, formed from the Waters of* Matlock, *in* Derbyſhire. *By* Mathew Dobſon, *M. D. Communicated by Dr.* Fothergill.

Redde, Jan. 13, 1774.

DURING a ſhort ſtay at MATLOCK, this ſummer, I made ſome obſervations on the petrifying quality of the waters, and examined a very ſingular *Stratum*, which has been formed in their courſe.

This *Stratum* I found about 500 yards in length; in ſeveral places, near 100 yards in breadth; and, where thickeſt, from 3 to 4 yards in depth. The manner, in which this body of ſtone has been produced, is eaſily aſcertained.

Within the memory of ſome perſons now alive, the waters of Matlock were not appropriated to the purpoſes either of bathing or drinking. They iſſued from near the bottom of the hill, which lies to the weſt, immediately behind the preſent houſes, and ran, at random, down a declivity of about 100 yards, to the river DERWENT. In their courſe, they formed large petrified maſſes, intermingled with great quantities of petrified moſs, nuts, leaves, acorns, pieces of wood, and even trunks of trees.



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The waters were thus conſtantly raiſing obſtacles to their own progreſs, and were frequently therefore forced into new channels; ſo as, by degrees, to be extended over a ſurface of at leaſt 500 yards in length. And, by being repeatedly returned into the ſame channels, a *Stratum*, of conſiderable thickneſs, has been formed.

On examining this *Stratum*, ſome parts are diſcovered to be extremely hard, and others ſo ſoft, as eaſily to be cut. The ſoft parts, however, on expoſure to the air, become as hard as flint; and on being ſtruck, ſound like metal. The reaſon of this difference in the hardneſs of different parts, appears to be this: as the waters frequently changed their channels, and repeatedly likewiſe returned again to the ſame channels, if, in the intervals, there were any parts conſiderably raiſed, and conſequently longer before they were covered with freſh incruſtations, theſe, from a longer expoſure to the air, would acquire a greater degree of hardneſs.

Whole houſes, in the neighbourhood, are built of this ſtone, which they find more durable, than any other they meet with; and as it has the excellent property of growing harder, from being expoſed, and has likewiſe many little cavities and interſtices, good mortar ſo inſinuates itſelf into theſe, as to form a wall as firm as one continued ſtone.

This *Stratum* affords very curious and beautifully varied petrifactions. Moſs exhibits great varieties; for it is evident, that the moſs has continued to vegetate, after the roots and lower parts had

had been penetrated by the ſtony particles; and thus, ſtretching itſelf to a conſiderable extent, it has, in ſome places, been mixed and interwoven with other ſubſtances. In ſome parts, ſnails have been arreſted in their ſluggiſh walks, and locked up in the ſtony concrete. In others, the petrifying matter has ſhot, in different directions, and formed an intricate kind of net-work. And in others again, there are large maſſes, which, on being broken aſunder, are found hollow; and their cavities ornamented with branches of petrifaction, ſomewhat reſembling coral, but of a darkiſh-white colour, and generally of a rough and granulated ſurface.

Under the *Stratum* there is, from a foot to a foot and a half, of good ſoil; and immediately under this lies the limeſtone rock. The ſoil is of the ſame nature with that of the adjoining fields, which form the ſlope of the hill, and is evidently a continuation of that ſoil.

Any further additions, to this petrified *Stratum* are now inconſiderable, and in many places none at all; for the two principal ſprings are confined to their channels, covered from the day, through the greateſt part of their courſe, and are rapid in their motion.

Had proper obſervations been made on the progreſs of this *Stratum*, a tolerably exact eſtimate might have been formed, with reſpect to the time, when theſe waters were firſt impregnated with their mineral ingredients. From theſe two conſiderations, however, that the *Stratum* is not very thick, and that the ſoil, immediately under it, is a

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continuation of that, which lies on the ſlope of the neighbouring hills, it is probable, that many centuries have not been requiſite to its production; and, conſequently, that theſe mineral waters are not of very antient date.

And, if we may rely upon an obſervation, which I had from a plain, inquiſitive, and intelligent man, on the ſpot, the ſource, whence theſe waters derive their impregnation, is in ſome degree exhauſted. This perſon aſſured me, from his own experience, that pieces of moſs, and other ſubſtances, put in the courſe of the waters, and in the ſame circumſtances as formerly, require more than double the time, for their petrifaction, that they did thirty years ago.

The *Stratum*, therefore, from which the Matlock waters are impregnated, muſt either be conſiderably exhauſted; or the waters have deviated from their former courſe, and are now only partially diſtributed over this *Stratum*.

Liverpool, Oct. 15, 1773.

XVII. *Re-*