

or upwards. He told me, he believed the Stone had been growing there for near thirty Years; but never apprehended it to be a Stone, but used to complain of a Weight, as if it were half a Pound, carried between his Legs.

John Sisley,
Surgeon and Apothecary,
Town-Malling, Kent.

XVII. *A Letter from Mr. Moreton Gilks, F. R. S. to Dr. Mortimer, Sec. R. S. giving some Account of the Petrefactions near Matlock Baths in Derbyshire; with his Conjectures concerning Petrefaction in General.*

S I R,

IN the mountainous Part of *Derbyshire*, about *Cromford*, is a Valley of at least a Mile and half long, walled on each Side with high craggy Rocks; the East Side cliffy, the West more reclining, but extremely rough and difficult of Ascent; being composed of large loose Pieces of the Lime-stone Rock, of five, ten, or twenty Ton Weight; that seem at some Distance of Time to have broken off from the Top of the Cliffs, and fallen down into the Valleys.— At the Bottom of the Valley, which seems to be a great gaping Fissure of the Rock, runs the River *Derwent* harshly along its rocky Bottom. About the Middle of the Valley, at near 50 Foot perpendicular Height from the River, issue forth several Ri-

Rivulets of a luke-warm Water, that pour themselves into the *Derwent* below. Some of this Water, being collected in a Reservoir, on account of its agreeable Warmth, hath of late Years been much used for bathing, and is called *Matlock-Bath*. Now for about the Compass of 500 or 600 Yards, near to where this Water gushes out, the Stone appears of a very different Texture and Complexion; and proves, upon Examination, to be a perfect Incrustation, formed upon the original Rock; composing a factitious Stone, of Earth, Vegetables, &c. of various Kinds, such as usually grow in rocky Places, as Polypody, Tricomans, and other Species of the capillary Tribe, Mosses, Brambles, Ivy, Hazle, &c.— There are several large Grotto's at about 15 Foot above the Level of the River, lined most curiously with the *Stalactitæ*, *Lapides Stillatitii*, &c. Some of them nearly resemble large Bunches of Grapes, and other Clusters of Fruit, very beautiful to look upon. Specimens of most of them I think I have sent.—I found upon Examination, that the farther you penetrate into this Mountain, the closer and more compact the Stone appears; the Interstices in the petrified Matter being at the Depth of 15 or 16 Foot, almost filled up, and nearly as solid as the Lime-stone, of which the original Rock is composed; and even within four or five Foot of the Surface, though very open and porous; yet is it so hard as to be used in the Building about the Bath; and I imagine it may be equally durable, though easier to work with the Saw, than the close Lime-stone.

The Mountain in several Places jets out almost over the Brink of the River; under these Protuberances
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are the Grotto's, very dangerous and difficult to get at. It was here the Specimens I send you were collected †, but it is impossible to give you an Idea of the natural Beauty of the Place. The Frost-work, and incrufted Plants, are some of them fo very delicate and tender, as to make it impracticable to bring them away with half their Beauty, by the moft careful Conveyance. In one Place there is an Ivy creeping along the Rock, part of it intirely petrified, another part only incrufted, and a third ftill vegetating. In another Place is a Hazle-tree, the Root whereof composes a Part of this petrified Mountain, the Branches fome petrified, and fome tenderly incrufted. As thefe are changed, others fpring up, and in Time will undergo the fame Fate. In fhort, nothing in Nature can give a more clear Idea, or more beautiful Representation, of the whole Bufinefs of Petrefaction, than a curious Observer will fee, and frame in his Mind from this Mountain. He will fee, that not only the Water, as it diftills out of the Rocks, is capable of incrufting and petrifying the Bodies it meets with in its Passage, but that even the Steams and Exhalations*, being highly faturated with thefe mineral Particles, will work the fame Effect; as is evident in the Place under Confideration, and will generally beft account for the Supply of petrifying Matter, brought to fill up the Vacuities that are left by the Decay and Waste of Vegetables incrufted over; and which, he will fee, are in Courfe of Time constantly filled therewith. For although the Water of fome

† They are depofited in the *Mufeum* of the ROYAL SOCIETY.

* Vide *Woodward's Natural Hiftory*, p. 136. 209.

Springs may be so loaded with mineral Matter, as, perhaps by penetrating the Pores of Wood and other lax Bodies, to increase greatly their specific Gravities; yet surely it is contrary to the Laws of Matter, and absurd to say, there is any hidden Property in such Waters capable of changing the Parts of one Body into another Body specifically different. It may in time, no doubt, lose its Texture and Coherency, by the Admittance of heterogeneous Particles of different Attractions; but the Cause of Coherency in the Parts of the original Body must intirely cease, and be dissolved, before it can be said to become a Part of any other Body whatever. Afterwards, indeed, the Space that was possessed by the Parts of the original Body, may be supplied by those of the new one, so as to make in time a uniform Stone in the Shape of the original Plant: But if this petrified Plant be still kept in the Place where the same petrifying Quality continues to act upon it, it will lose even that Shape, and become a Part of the Body it is contiguous to; and so a great many of these petrified Plants, and other Bodies united together, will compose large Masses and whole *Strata* of Stone. This is clearly the Case in the Instance now before us, and perhaps it might be carried so far as to strengthen our Conception about the general Formation of the *Strata* of Lime-stone or Marble; that appearing to be every-where, (notwithstanding Dr. *Woodward* dispatches them much more expeditiously *) but especially in the *Peak of Derbyshire*, such a Petrefaction as I

* *Woodward's* Natural History, Part II. Conf. 4.

have been describing, quite finished. I could urge many Reasons for my Supposition, but I will not trouble you with them here, the Compass of this Letter not permitting me; nor do I know how far such Conjectures are capable of being used, with regard to the received Opinion of the World's Age; but if we had as good Authority to suppose it 60,000 Years old, as we have 6000, it would be worth the while to trace the Origin and Source of these petrifying Exhalations a little deeper than seems to have been done by Dr. *Woodward*; and might either perfect his History, or produce a more rational System of the Earth than has yet appeared.

You will find, amongst the things I send, some Land-coral found in a Lime-pit, where is a great Quantity of it, between Two *Strata* of Lime-stone of at least Three Foot thick. You will find also some few Pieces of *Pseudo-sapphirus*, and other kinds of Spar; they are such as I picked out of the Fissures of the Rocks I have been describing. There is a vast Variety of these things in the *Peak*, much greater than hath been taken Notice of by any one; as I shall convince the ROYAL SOCIETY, when I am able to present them with a complete Collection of *Derbyshire* Fossils, in which I have already made some Progress: Who am,

S I R,

Burton, Nov. 26. 1735.

Your most humble Servant,

Moreton Gilks.