

1. The first limestone 150 feet, with much white chert.
2. The first toadstone 48 feet, vesicular and amygdaloidal.
3. The second limestone 150 feet, contains beds of magnesian limestone.
4. The second toadstone 128 feet, more compact than the first toadstone.
5. The third limestone 180 feet, contains black madreporine beds.
6. The third toadstone 66 feet, uncertain.
7. The fourth limestone not pierced through, uncertain.

This may be an approximation to the thickness of the five upper beds near Matlock Bath, but is by no means an accurate statement of the succession and thickness of the beds in other parts of the county. It may be proper to remark also, that the limestone is distinctly stratified, and the strata of limestone are often divided by strata of clay, provincially called *way-boards*, and also by strata or rather seams of siliceous stone called chert, resembling flint, but less splintery in the fracture, and fusible; which latter property is doubtless owing to an admixture of calcareous earth. These strata of chert occur most frequently in the upper limestones; they contain, like the limestones, remains of shells and encrinites. As loose blocks of chert with encrinites are sometimes ploughed up in the fields, Mr. Farey supposed that these blocks have been converted from limestone into chert by some unknown process,—an opinion for which there is not the slightest foundation. The chert blocks are the remains of hard strata, which have resisted decomposition or destruction, in the same manner as nodules of flint in the upper chalk. Large bivalve shells (*Productus*) are found both in the limestone and chert. The thick beds of toadstone that divide the upper from the lower limestones, were supposed by Mr. Whitehurst to have been protruded between them in a state of fusion: this opinion will be examined subsequently. Admitting its truth, it would sufficiently account for the great irregularity in the thickness and succession of these beds, which is known to prevail throughout the Peak of Derbyshire. All the miners that I have examined on the subject, agree that the warm springs which abound in the vicinity of Matlock, rise from under the second toadstone, and that when this bed is first pierced through, the water has often a higher temperature than the Matlock Bath water, but its heat is reduced by admixture with cool springs in the upper beds.

I have now to observe that the descending series of limestone and toadstone to No. 5., or the third limestone, may all be found in the vicinity of Matlock, and many other parts of the mining district; but the beds of toadstone are of variable and uncertain thickness. With respect to the third toadstone, its occurrence as a regular bed is extremely doubtful. In some situations there are eruptions of toadstone intervening in the third limestone, which is of vast thickness, but these beds of toadstone are in general extremely irregular: