

where they occur, they of course divide the third limestone into two beds. The irregularity of these beds of toadstone, and the disturbance of the regular strata which they have caused, compelled Mr. Farey to call them *chance beds*, to avoid the admission of their igneous origin. In the same manner he explained the protrusion of the granitic range of rocks in Charnwood Forest; he described them as *chance beds in the red marle*; it was surely an extraordinary chance, which produced rocks that extend under every other rock formation in the midland counties of England. There are, however, circumstances attending the stratification of the mountain limestone of Derbyshire, that have not been noticed by any of the authors I am acquainted with, who have described this country. There are evident indications of an upheaving force acting on several parts, and bending the strata into arches, the segments of large curves as represented Plate II. fig. 1. and fig. 6. These curves are sometimes complete in the same hill, but frequently their continuity is broken. The strata of Matlock high Tor have been described by former writers as plain, and when seen in face of the rock they appear to be nearly so, but they are in reality curved, as shown Plate I. fig. 6. They enfold the back part of the hill, and are continued into the opposite hill, Masson, which they also enfold. The continuity of the strata is broken by the vale of the Derwent, which makes their true form more difficult to trace: but the arched stratification of the lower part of the same beds is distinctly displayed westward, and may be seen from the road near Matlock toll bar, where a section is made by the Derwent.

A very remarkable instance of the arched stratification, completely formed in one situation, may be seen four miles east of Matlock, in the isolated mountain called Crich Cliff, which rises about nine hundred feet above the Derwent. The strata rise all round, and enfold it, forming nearly spherical segments, as represented in the annexed cut. This section, through the hill, represents the arrangement of the beds of limestone which dip all round the hill *ccc*, but are somewhat flattened at the top; the shale and gritstone surrounding the lower part of the hill are represented *ab*. The true structure of the hill has been discovered by recent mining operations; several valuable metallic veins have been explored in it, and a gallery has been driven into it, as represented in the figure *f*. It is obvious that this arched structure can be formed only by protrusion, whereas the elevation or inclination of plane strata may have been produced by subsidence. Now, when we consider their near proximity to beds of toadstone of igneous formation, we can have little difficulty in assigning a cause for this protrusion; but, fortunately, we are not here obliged to have recourse to conjecture: in driving the gallery towards the centre of the hill, a mass of toadstone was met with (*E E*), which was not cut through when I visited the place in 1830. The same toadstone was found by sinking a shaft upon it, as represented in the