

and to have crossed the very ground where the armies of Cyaxares and Alyattes probably met. And if the order of events belonging to the reign of Cyaxares, as related by Herodotus, does not accord so exactly as might be wished with this determination, and cannot be entirely reconciled to their dates, Mr. Baily would attribute the confusion to the want of authentic documents at the time the history was written.

Although the author has employed in these calculations the secular variations of the moon's mean longitude, mean anomaly, and mean distance from her node, as deduced from the formulæ of Laplace, and given in the *Tables Astronomiques*, he expresses some doubts of the accuracy of these results; and his doubts are founded upon an eclipse recorded by Diodorus to have happened during the voyage of Agathocles from Syracuse to invade Africa, in the year 310 B. C., in which, when computed according to the present tables, the path of the moon's shadow appears to have passed so much more south than Agathocles can be supposed to have been at that time, that the latitude of the moon would require to be at least  $3^{\circ}$  greater than our present tables make it.

These observations (if correct) would show the necessity of some alteration of the secular variation of the moon's mean distance from her node; but this hypothesis, Mr. Baily observes, could not be reconciled with the eclipse mentioned by Herodotus; for by means of a corresponding correction, the eclipse of 610 would be found not to be total to any part of Asia Minor; and there is no other that could possibly be central and total within the utmost limits that are reconcileable with any received systems of chronology.

*An Account of the great Derbyshire Denudation. By Mr. J. Farey, Sen. In a Letter to the Right Hon. Sir Joseph Banks, Bart. K.B. P.R.S. Read March 21, 1811. [Phil. Trans. 1811, p. 242.]*

It is now well known, says Mr. Farey, to many observers in geology, that the clay strata on which the metropolis is situated, extend north-eastward through Essex, Suffolk, and Norfolk, and are incumbent on the great chalk stratum, which reaches from the Isle of Wight to Flamboro'-head; and that these, as well as many subjacent strata that are known, dip in general to the south-east, and basset out, or appear at the surface in succession, to any one travelling toward the N.W., until he has passed certain strata of lias, clay, and sand. Beneath these, says the author, are found marks of an immense stratum of red marl, which seems (to him) to have extended over all the remainder of the British islands. In this stratum are contained local strata of gypsum, rock salt, sand, micaceous grit-stone, &c.: to this stratum also, according to the author, belong the great nodules of slate, green stone, sienite, basalt, &c. that form hills or mountains, intersected by mineral veins, in the western parts of the kingdom. In many parts, however, the red marl itself is no longer found; but instead of it various strata, subjacent to it, have

been elevated to a considerable height, and subsequently denuded by the operation of water, as observed by Dr. Richardson, in his remarks upon the basaltic counties of Antrim and Derry in Ireland.

It is to these tracts of elevated strata, and their abrupt terminations, or *faults*, in the county of Derby, that the author's observations have been principally directed; and he enumerates a series of *four* different elevations, in succession, one within the other, of which the innermost is most elevated. The outermost, or least elevated, extends from Nottingham northward into Yorkshire, as far as the river Wharf, this being the eastern boundary of the tract; while its western boundary extends from near Stone, in Staffordshire, to the neighbourhood of Manchester. On the south it is bounded by a fault, which the author calls the great Derbyshire fault; but its northern extent has not yet been ascertained by actual observation.

The second tract, which is much more elevated than the preceding, is separated from it by a fault, which, from the irregularity of its course, is termed the zigzag fault. The elevation of this second tract, on its southern extremity, is such as to bring the great limestone shale, which underlies all the coal strata, against the red marl at the surface.

The third inner tract is considered by the author as still 400 yards more elevated than the second; so that the fourth or lowest limestone rock is raised into a high hill, with red marl at the foot of it, on the other side of the great Derbyshire fault, which here occasions a derangement far exceeding anything that has hitherto been conceived to exist.

Of these tracts the outermost appears to have but little inclination to the horizon; but the second and third are inclined to each other, and to the adjacent strata, in a direction from S.W. to N.E., the mutual intersection of the strata, or hinge on which they may be supposed to turn, passing from Cromford in a north-westerly direction.

The fourth tract includes Bakewell, and a small district round it, and is surrounded by a fault, which Mr. Farey denominates the Bakewell fault. The western side of this tract is most elevated, as well as that of the third, so as to occasion a great elevation of some strata of toadstone, in situations where their appearance had not before been explained. It is in this district that, in Mr. Farey's estimation, the lowest strata anywhere observable in Britain appear. He reckons as many as three distinct series of coal measures, separated by thick strata of limestone, and of red marl, similar to that which intervenes between the lias and the uppermost stratum of coal; and the lowest of the coal measures is that of the coal-field of Derbyshire, Nottinghamshire, and Yorkshire, lying beneath the yellow limestone rock. Beneath these follows what is called the fourth limestone rock, which extends from Castleton, in Derbyshire, southward to Weaver-hills, near Wootton and Ramsor in Staffordshire. This he supposes to be the lowest of all British strata; and to this circumstance ascribes the occurrence of some phenomena, which are said to appear nowhere else.