

of *single* movements of the stratified rocks thus becomes a criterion of importance in estimating the value of these contrary views.

Anticlinal axes, such as that of Snowdonia, great faults, like that of the Penine chain, will perhaps be easily acknowledged to be absolutely unparalleled in historic periods; but this inequality of mere magnitude will not furnish a shadow of evidence against the application of the doctrine of the sufficiency of modern causes, unless it be proved, or shown to be probable, that the chain of Snowdon, and the ridge of the English Apennines, were thrown up by one, or, at most, a few efforts. Now this is *probable* in each case, for reasons based on observation, and, as will hereafter appear, not improbable for reasons founded in mechanical science.

Observation detects on the line of these great movements of the earth's crust no trace of the minutely confused and fragmentary condition of the strata, which must have been the result of an indefinite number of small convulsions, like those of the Chilian earthquakes in 1822 and 1835, when the ground rose convulsively a few feet; on the contrary, the simplicity and completeness of the anticlinals of Snowdon and the Isle of Wight, and the violent single fracture and few bold contortions on the Penine fault (which ranges for above a hundred miles, and may possibly extend much farther), speak of one or a few powerful efforts. This is so much the more to be trusted, as the effect of the friction on the surfaces of motion has the same character of simplicity. The area uplifted by the Penine fault may be roughly estimated at 2000 square miles; and the vertical extent of the movement may be taken, on the average, at 2000 feet. The Chilian earthquake, even if the ground were uplifted 4 feet for 100,000 square miles (neither of which assumptions seems at all supported by the narratives which are published*,) would yield, at most, only $\frac{1}{10}$ th part of this mass of land.

* See p. 206. On the subject of the Chilian earthquakes, consult, generally, the Geological Society Proceedings, vols. i. and ii.