

## SCOTCH GRANITE ON WELSH HILLS.

SIR,—Mr. D. C. Davies, F.G.S., is reported to have stated at a meeting of the Geological Society on the 7th of January (after the reading of my paper), that Scotch granite is to be found on the Welsh mountains up to 2000 feet above the sea! Mr. Davies would oblige, not only myself, but, I have no doubt, many of the readers of the *GEOLOGICAL MAGAZINE*, by mentioning the locality, and whether the granite has been identified by tracing it northwards to its source.

D. MACKINTOSH.

## ORIGIN OF EARTHQUAKES.

SIR,—I have only just been fortunate enough to see Mr. Malet's interesting paper on the Origin of Earthquakes which appeared in the February number of the *GEOLOGICAL MAGAZINE*, 1873, Vol. X. p. 74.

I cannot think he has satisfactorily accounted for them, referring them to the action of water percolating underground, wearing away the rocks, and by so doing causing subterranean landslips. Surely if it is to this that Earthquakes owe their origin, they would be found occurring in every country, but far more frequently in those in which is the greatest rainfall. Great Britain and Ireland are probably the most rainy countries in Europe, and accordingly ought to be those most severely shaken by Earthquakes; nevertheless, these are countries nearly entirely exempt from such shocks. No doubt many Earthquakes do occur in England every year, but of so slight a character as to be perceptible only by special instruments for detecting them, and Mr. Malet is evidently referring to those of a more severe character.

On the other hand, when we appeal to that observation of facts on which Mr. Malet lays rightly so much stress, we find a close connexion between the distribution of volcanic areas and the frequency of earthquakes; both volcanos and earthquakes have, in the main, developed themselves in the same directions, and the latter increase in frequency on approaching the focus of volcanic activity.

Again, we hear of earthquakes ceasing when a new volcanic vent has been formed in the district, or an old one re-opened. This is apparently another indication of the community of origin of volcanos and earthquakes, the former acting as a safety-valve to the latter, but by Mr. Malet's theory I can see no explanation of it.

Again, we know that eruptions are attended and preceded by earthquakes, though not of the first magnitude, but instead of considering the eruption the effect of the earthquake, it seems to me more reasonable to assign them both to a common cause, namely, the expansion of subterranean matter causing rendings in the rocks from an over state of tension, and when, as in this instance, occurring at a comparatively slight depth, the melted matter forcing a way to the surface will flow over it as an eruption. The greatest earthquakes frequently take place far from volcanic areas; but we may, I think, with some confidence refer them to the same cause producing the minor shocks; only that taking place at too great a depth for the