

It may therefore be worth while for me to appeal to the second edition of my "Descriptions of Volcanos," published so long ago as 1848, as showing, that although in my earlier publications I had been led by the authority of Professor Buckland to attribute the formation of valleys to catastrophic action, such as the Noachian Deluge, I had for many years abandoned that hypothesis.

This circumstance might of itself have been considered a tacit acknowledgment on my part of the value of Mr. Scrope's earlier contributions to Geology, but I was glad of the opportunity afforded by the publication of my recent paper "On the Antiquity of the Volcanos of Auvergne," of more distinctly recognizing the claims of the author alluded to, to the merit of having been the first of our countrymen who clearly pointed out the evidence afforded by the valleys of that volcanic district, as to the erosive agency of rivers continued during long periods of time.

CHARLES DAUBENY.

Oxford, May 5th, 1866.

THE LONGMYND AND ITS VALLEYS.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—I have just read Mr. Mackintosh's paper in the April number, as well as his letter in the May number of the GEOLOGICAL MAGAZINE.

I am well acquainted with the Longmynd and its valleys, and I am still of the same opinion that I formed more than twenty years ago, as to the origin of those deep valleys, locally called "gutters." I feel not the slightest doubt that they were cut by running brooks. I know of no better locality to which I would refer for so good an example, to show the result of long-continued wear by running water, than the Longmynd with its deep valleys. If the brooks that now run in these valleys have the power to furrow even their bottoms, they require only time to cut down a thousand feet. I believe that the action of the sea could in no way excavate those valleys or any similar ones.

I may add, that after many years of constant observation in the field, on a subject I have always been particularly interested in, I feel now convinced that an immense amount of denudation is due to causes subaërial, and not to the action of the sea.

I am, Sir, yours truly,

W. TALBOT AVELINE.

GEOLOGICAL SURVEY OF GREAT BRITAIN,
EDEN MOUNT, KENDAL, 7th May, 1866.

A DENUDING AGENT.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—I have all my life been a diligent explorer of little brooks, in search, I must confess, of beauty rather than fossils. I have often been struck with the steady, and by no means unsuccessful, co-oper-

ation of roots of trees with the waters of a streamlet, in undermining and removing the banks. If you examine almost any one of the little tumbling rills among the mountains of the Upper Carboniferous formation, you will find it buried in trees. The fibres of the roots insert themselves in the smallest crack, and push themselves between the layers of rocks; and by degrees they thicken and grow strong, and lift huge masses of stone, with a seemingly irresistible force, loosening the earth at the same time above and below and around. The action of the rain easily washes away the earth, the little tree becomes a great tree, and, either because it is undermined beneath, or because the weight above becomes too much for its hold, it is sure to come down with a crash into the brook, carrying with it a large portion of the bank in its fall. The next flood removes all trace of the ruin. The sand and soil and the small stones are swept away, while the larger stones keep their places peaceably in the channel where they fell, to make fantastic waterfalls and still hollows for the minnows.

Yours, etc.,

T. ASHE.

LEAMINGTON COLLEGE, May 7th, 1866.

DENUDATION.—REPLY TO MR. G. POULETT SCROPE AND
MR. J. B. JUKES.

To the Editor of the GEOLOGICAL MAGAZINE.

SIR,—The appearance in your Magazine of two communications on Denudation renders it necessary that I should again trouble you with a few remarks before the completion of the series of observations on which I am now engaged.

Not having visited the localities described in your last number by the eminent author, Mr. G. Poulett Scrope, I can offer no opinion relative to the conclusions at which he has arrived. I should not think of underrating the power of temporary as well as permanent torrents, to excavate channels in the gravels of the Tyrol, Cumberland, Wales, or any country subject to waterspouts and heavy falls of rain; and I could agree with all that Mr. Scrope has advanced concerning the denudation of Auvergne, without requiring to recant any opinions I have advocated. The facts on which Mr. Scrope's reasonings are based, namely, the resistance offered to the atmosphere by the *basaltic cappings* of the mountains of Auvergne during an immense period of time which can scarcely be exaggerated, furnishes, perhaps, *the most convincing proof which can possibly be adduced, of the impotence of rain as a denuding agent on hard rocks,*¹ and ought to prepare our minds for believing that many of the inland sea-cliffs and rocks of England and Wales have retained their wave-worn shapes since the Glacial submergence, if not since a much more

¹ The phrase "impotence of rain," I have applied only to the action of mere rain on compact rocks and grass-covered land, and not to torrents, charged with solid abrading matter, and acting on exposed gravel, loose stones, or soft materials. When using the phrase, I was not alluding to volcanic or alpine districts where conditions are, or have been, *exceptionally favourable* to atmospheric denudation.