stand under what conditions it can become an excavating one, and how it can hollow out basins, &c.

When ice moves away from the slope which gives impetus to a glacier, the motion rapidly slackens and presently stops. The distance travelled over the level ground is a function of the weight of the glacier, of the amount of the slope, the friction of its bed, &c., *i.e.* of the elements making up the *vis a tergo;* but in the very largest glaciers, so far as observation goes, the motion rapidly ceases on level ground. This is the evidence wherever the phenomenon has been observed and reported upon.

This being so, I altogether question not only the arguments of those who champion the excavation of lake basins by ice, but also of that larger school who invoke movements of ice over level plains of many hundreds of miles in extent in order to explain the drift phenomena. They do it, so far as I know, on the ground that they cannot appeal to any other cause without doing injustice to that modern metaphysical bogey, "The Doctrine of Uniformity." My small boy might just as well, on the same principle, attribute the excavation of his porringer to the porridge in the bowl. True rock basins were no doubt very largely due to the weathering of rocks which exfoliate, and whose structure is not homogeneous. This is a very old explanation, but like many sober old inductive truths it is not so attractive nowadays as an appeal to the imagination, combined with a good, sturdy, consistent loyalty to some *à priori* postulate, which would have won the hearts of the old schoolmen.

HENRY H. HOWORTH.

30 Collingham Place, Cromwell Road, November 16.

Rock Basins in the Himalayas.

THERE is one statement in the interesting communication of my colleague, Mr. T. D. LaTouche, which seems to require qualification. After a tolerably extensive experience of the Himalayas, I should be inclined to say that rock basins are of fairly frequent occurrence, of all sizes from the largest to the smallest, but they are almost without exception filled with stream deposits, and only occasionally can their formation have been due to glaciers; for they are usually found where there are no traces of glacial action to be seen, and at levels to which we have no reason to suppose that glaciers ever reached. In the hills of eastern Baluchistan, where the rainfall is much less than in the Himalayas, rock basins more or less filled by recent surface deposits are even more common, and here their origin by deformation of the surface can generally be established. The same cause probably accounts for the Himalayan rock basins, as there are abundant proofs that the elevatory movement has been far from uniform, and that the variations in its intensity have been both extensive and often extremely local. There are frequent occurrences of surface deposits which appear to have originally been formed in rock basins, but have since been cut into by the streams, owing to the corrasion of the barrier, and we may attribute the absence of lakes in the Himalayas to the rapid current and large burden carried by the streams, in consequence of which they have been able to fill up the basin, and often to corrade the barrier, as fast as it was formed.

R. D. OLDHAM.

"Composite" Dykes.

PROF. JUDD'S excellent paper in the current issue of the *Quarterly Journal of the Geological Society* (p. 536) calls to my mind some common and similar examples among the "elvans" of Cornwall (which are dykes in the ordinary acceptation of the term), and but little has been published offering some explanation of their bearing on surrounding rocks. I have observed, notably in the district of Cligga Head (nine miles N.W. of Truro), the marked difference between the structures exhibited by dykes in the parts in contact with the rock through which they intrude (in the Cligga instance Devonian slate), and their centre, amounting almost to a rock distinction.

In the appended sketches I have endeavoured to illustrate my meaning from actual instances.

Fig. 1 represents a section of an elvan or dyke outcropping slightly to the north of Cligga promontory, and from its position apparently connected with the main mass of Cligga Head granite. It bursts through the slate. The centre (*b*) of the dyke consists of a rock of homogeneous texture, quartzo-felspathic base, and some scattered porphyritic felspar crystals. The sides (*a a*) in contact with the slate (*s s*) show a rock of apparently similar base, but shot with long acicular crystals of schorl, the whole rock being of a very dark colour, due probably to the presence of wolfram.

Fig. 2 is a section of a very common form of Cornish elvan, consisting of alternate laminæ of granite (*d d*) and "schorl rock," that is, rock consisting of schorl and quartz, generally in about equal proportions (*c c*).

These bands are very common in the slates and in the granitic bosses. Further, an analysis of a typical "schorl rock" of this class showed a silica percentage of 67·6 (*vide* Judd's paper,

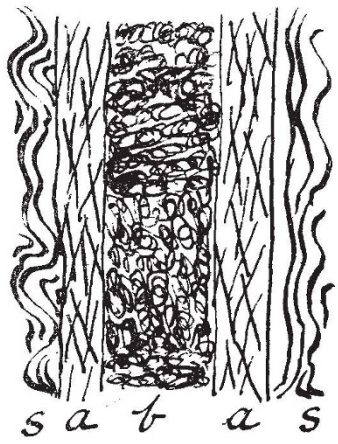

FIG. 1.

p. 545), and of a typical granitic band of 74·8 (De La Beche, "Report on Geology of Cornwall, Devon, and West Somerset," p. 189). It is very doubtful, however, if either of the above instances is a case of a dyke putting on such differences in mineralogical and chemical character in its several parts as to amount to a difference of rock species.

As De La Beche points out, the schorl rock may be simply a granite in which the felspar and mica are replaced by schorl. An instance, however, of a rock one may call "a dyke within a dyke" is the Cligga mass itself, which is nothing but a gigantic dyke. De La Beche, in his work above cited (p. 164), has figured it. The dyke is so strikingly split into layers as to

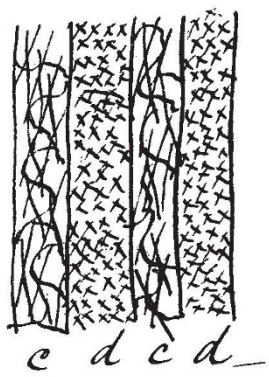

FIG. 2.

appear stratified, the hard comparatively small-grained layers standing out in bold relief from the contiguous layers of more easily decomposed rock with their large porphyritic felspar crystals.

Besides the difference in size of the felspar crystals, the harder rock is much darker in colour (being of a red hue) than the softer, which is pale pink and in places whitish. These physical differences, however, count for little in drawing a distinction of rock species between the layers, and I was unfortunately unable to avail myself of any published analyses of the different parts, but their superficial characters are so distinct as