

and the production of their pegmatites, a series of powerful mechanical movements crumpled, crushed, and sheared the whole mass, and produced in it a distinct foliation. Portions of one kind of material, such as dark hornblende, have been separated from the rest, and have been involved as distinct lumps in another variety such as gray quartzose gneiss.

The detailed investigations of the Geological Survey have further shown that, after the first foliation had been superinduced, a new series of igneous protrusions invaded the gneisses, chiefly in the form of dikes. The earliest and most conspicuous of these are extraordinarily abundant basalt-rocks, running as long parallel bands in a general W.N.W. and E.S.E. direction. The latest are dikes of granite or syenite, while probably of intermediate date are

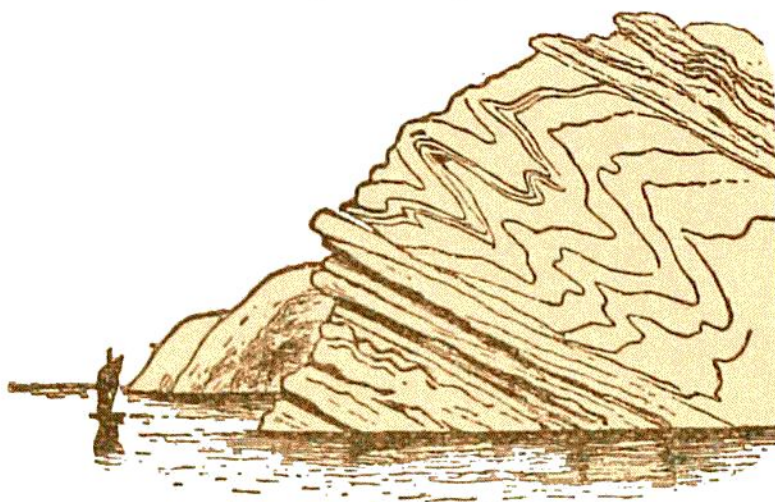


Fig. 329.—Plicated banded gneiss between masses that have been sheared parallel to the thrust-planes, north side of Loch Torridon.

certain highly basic dikes, among which peridotite and picrite are characteristic. The evidence as to the relative dates of these igneous intrusions being tolerably clear, we have here proofs of a long interval of subterranean activity, during which the magma that was first injected into the gneiss in such basic form as basalt parted progressively with its more basic constituents until it became in the end quite acid. It is interesting to find, even among the most ancient rocks of Britain, a sequence of eruptive materials, like that which appears so markedly among the Palæozoic and Tertiary volcanic phenomena (p. 444).

After the injection of these various eruptive materials, the whole region of the northwest of Scotland was once more subjected to powerful dynamic movements, whereby all the rocks were profoundly affected. The results of these opera-