

been deepened sufficiently to carry off all the drainage that might come from any longitudinal valleys. These valleys, therefore, could not cross it, but must needs pour their waters into it, and help in this way to increase the rapidity of its excavation.¹ To the south-west of the valley of the Garry, Tummel, and Tay there is a number of short valleys or depressions running parallel to it across the ridge of hills between Loch Tay and the Lowland border. Some of these, like Glen Ogle, pass completely across this ridge, and on the north-west bank of the Loch Tay valley they find their counterparts in depressions which trend to the north-west towards Rannoch. It almost seems as if these depressions once ran south-eastward, across what is now the deep hollow of Glen Dochart and Loch Tay, that hollow having since been gradually cut out, so as to sever those transverse valleys and divert their drainage in great part into its own channel.

I believe that many of these anomalies in the trend of the valleys are not to be explained by reference to any rock-structures now exposed at the surface, but that they point to the drainage-lines having had their trend determined before the schists were uncovered, and when the country was still encased in a cover of Old Red Sandstone, of which only a mere ragged fringe is now to be found along the Highland borders. The lines of erosion traced by the rivers in this upper mantle of rock would, of course, have no

all, but that after the removal of a great mass of rock by the sea, and other denuding agencies, the crack still gave rise to a feature above ground and guided the sub-aërial forces in their work of erosion.

¹ The Memoir, by my friend the late Professor J. B. Jukes, "On the River-valleys of the South of Ireland," was the first endeavour to work out the history of a valley-system, and deserves the careful study of all who would follow the literature of this subject. It will be found in the *Quarterly Journal of the Geological Society*, xviii. (1862).