

inferior rocks. The Old Red Sandstone of Morvheim, in Caithness, overlooks all the primary hills of the district, from an elevation of three thousand five hundred feet.

The depth of the system, on both the eastern and western coasts of Scotland, is amazingly great — how great, I shall not venture to say. There are no calculations more doubtful than those of the geologist. The hill just instanced (Morvheim) is apparently composed from top to bottom of what in Scotland forms the lowest member of the system — a coarse conglomerate; and yet I have nowhere observed this inferior member, when I succeeded in finding a section of it directly vertical, more than a hundred yards in thickness — less than one tenth the height of the hill. It would be well nigh as unsafe to infer that the three thousand five hundred feet of altitude formed the real thickness of the conglomerate, as to infer that the thickness of the lead which covers the dome of St. Paul's is equal to the height of the dome. It is always perilous to estimate the depth of a deposit by the height of a hill that seems externally composed of it, unless, indeed, like the pyramidal hills of Ross-shire, it be unequivocally a hill dug out by denudation, as the sculptor digs his eminences out of the mass. In most of our hills, the upheaving agency has been actively at work, and the space within is occupied by an immense nucleus of inferior rock, around which the upper formation is wrapped like a caul, just as the vegetable mould or the diluvium wraps up this superior covering in turn. One of our best known Scottish mountains — the gigantic Ben Nevis — furnishes an admirable illustration of this latter construction of hill. It is composed of three zones or rings of rock, the one rising over and out of the other, like the cases of an opera-glass drawn out. The lower zone is composed of gneiss and mica-slate the middle zone of