

the Highlands east of the Great Glen traces of an original fragmental or clastic origin can be detected among the schistose rocks. Zones of argillaceous shales or slates passing into andalusite-slates,⁸² and of fine grit full of well-rounded fragments of quartz, felspar, or other ingredient, occur. Bands of coarse conglomerate lie on different horizons, the pebbles (granite, gneiss, etc.) being enveloped in a schistose matrix. Microscopic investigation likewise reveals, even among crystalline mica-schists, traces of the original water-worn granules of quartz in the sandy mud out of which the rocks have been formed. It is deserving of remark that the rocks along the southern margin of the Highlands are, for the most part, so little affected as closely to resemble portions of the unaltered Silurian series of the south of Scotland, and that they dip toward the mountains, becoming more highly foliated and crystalline as they recede from the lowlands. It is also noteworthy that zones of graphitic schist can be traced through different tracts of the Highlands, and that these schists and their associated strata bear a close resemblance to the carbonaceous bands associated with sedimentary deposits, such, for instance, as the Silurian anthracitic graptolite zones of the southern counties.⁸³

Various eruptive rocks traverse the Highland schists, and afford interesting studies in their relation to the problems of metamorphism. Thus in Banffshire and Aberdeenshire, large masses of diorite, diabase, and gabbro cut the schists in places, but run on the whole parallel with the general strike of the region. Their appearance, though later than that of the rocks through which they have come, was earlier than the regional metamorphism. The diorite has, in many places, itself undergone great alteration. Its component crystals have ranged themselves in the direction of

⁸² It is important to note, as showing the relation of regional to contact-metamorphism, that every stage in the development of the andalusite can be traced in these slates, though no eruptive rock appears at the surface. J. Horne, *Mineral. Mag.* 1884. I have proposed to class the metamorphic rocks of the Central and Southern Highlands by the name of Dalradian, for convenience of reference until their true geological position shall have been determined. Address to Geol. Soc., *Quart. Journ. Geol. Soc.* 1891, p. 75, and *postea*, Book VI. Part I. § ii.

⁸³ Among the less metamorphosed rocks that form the southern margin of the Highlands some zones of graphitic schist, together with chert bands and courses of igneous rocks, wonderfully remind the geologist of the similar assemblage of rocks in the south of Scotland. As this sheet is passing through the press Mr. Peach has detected radiolaria in these cherts, occurring much in the same way as they do in the radiolarian cherts of the southern uplands.