

PHENOMENA OBSERVED WHERE IGNEOUS ROCKS COME IN
CONTACT WITH STRATIFIED MASSES.

Induration of Stratified Rocks.

One of the most usual effects of moderate heat upon argillaceous and arenaceous compounds is to indurate and condense their substance: considerable heat causes the grains to agglutinate into a "grit;" extreme heat fuses most argillaceous and many arenaceous rocks into a slaggy or glassy matter, which upon cooling remains vitreous, earthy, or crystalline, just as Mr. Watt found to happen to the basalt of Rowley Hills. In the slags of furnaces, several minerals have been found crystallised. The effects of the heated rocks which fill veins and dykes, and spread above and below argillaceous strata, are very similar. When dykes are of small breadth, the alteration which is seen in the neighbouring rocks is very slight. Of forty-four dykes composed of greenstone, claystone, and other igneous rocks, which were carefully observed and described by the author, as they occur on the shore of the Island of Arran, between Brodick and Lamlash, very few were found to have produced in the adjacent red sandstone more than a slight induration, in a very narrow space close to the dyke. Where two dykes crossed, it happened sometimes that a vitreous substance ran along the line of intersection.* But on the sides of large dykes, 20 to 60 feet wide (as, for example, the great dyke of Cockfield fell in Durham), the shales are highly indurated and otherwise altered, and the sandstones rendered as hard and solid as some sorts of quartz rock.† In Salisbury Craigs,

* These descriptions are unpublished.

† Mr. Murchison has found numerous examples of this effect in his survey of the trap rocks of the silurian system, as in Caer Caradoc, the Corndon Hills, the Stiperstone ridge, and many others. One of the Corndon dykes, forty feet wide, with prisms lying across the dyke, composed of greenstone varying to felspar, has indurated the neighbouring argillaceous beds for two or three inches, so as to make them like the substance known as porcelain jasper; and for twelve feet the induration is remarkable.