

traverse the strata in all directions, it often happens that limited tracts are bounded on all sides by faults running into one another, so that such tracts are as it were insulated by them, and being surrounded on all sides by water-tight walls, their waters may be consequently drained without affecting those of the contiguous district; a circumstance of great advantage to the miner, who has thus on his hands the drainage of this limited tract only, instead of that of the whole adjacent country; hence it is necessary for him to use caution in piercing these faults, neglecting which he may at once overflow his own works, and drain all the neighbouring wells. The waters percolating among the coal-measures are very often chalybeate.

Salt springs have been sometimes found, but generally near the red marle, from which they may possibly have been derived, as at Measham in the Ashby de la Zouch field, and in that of South Gloucester; those however near Newcastle are too far from the red marle to be assigned to this cause: purging salts are found in the waters of Mosshouse lane and Tarleton on the north-east of Ormskirk, Lancashire, &c.

Thermal springs sometimes occur in the coal-measures; an example of this may be seen in the valley of the Taafe in South Wales, about six miles above Cardiff, under singular circumstances, for a thermal and strongly chalybeate spring there rises withing the shingly bed which forms the wintry channel of the river.

Section III.

MILLSTONE-GRIT, AND SHALE.

(a) *Chemical and external characters.* The coal-measures generally repose on a series of beds which are usually designated by the name of Millstone-grit and Shale. The millstone-grit is most commonly seen under the form of a coarse-grained sandstone, consisting of quartzose particles of various sizes (often sufficiently large to give the rock the character of a pudding-stone) agglutinated by an argillaceous cement. This sandstone differs from those which accompany the coal-measures, principally by its greater induration. It has every appearance of a rock mechanically formed from the detritus of pre-existent materials; and rounded particles of felspar may occasionally be traced in it. It sometimes, however, (though comparatively seldom) assumes a finer texture, in which the mechanical structure becomes less evident, and even passes into a hard and solid cherty rock.