

are always escaping from mineral coal, and are so often the cause of fatal accidents in mines, always contain carbonic acid, carburetted hydrogen, nitrogen, and oli-fiant gas. The disengagement of all these gradually transforms ordinary or bituminous coal into anthracite, to which the various names of splint coal, glance coal, culm, and many others, have been given.

We have seen that, in the Appalachian coal-field, there is an intimate connection between the extent to which the coal has parted with its gaseous contents, and the amount of disturbance which the strata have undergone. The coincidence of these phenomena may be attributed partly to the greater facility afforded for the escape of volatile matter where the fracturing of the rocks had produced an infinite number of cracks and crevices, and also to the heat of the gases and water penetrating these cracks, when the great movements took place, which have rent and folded the Appalachian strata. It is well known that, at the present period, thermal waters and hot vapours burst out from the earth during earthquakes, and these would not fail to promote the disengagement of volatile matter from the carboniferous rocks.

#### STRUCTURE AND ORIGIN OF THE APPALACHIAN CHAIN.

The subjects discussed in the preceding pages, lead me naturally to say something respecting the structure of the Appalachian chain, and its geological relations to the less elevated regions east and west of it. The annexed ideal section (fig. 5.), to which I shall have frequently occasion to refer in the sequel, will give some notion of the principal phenomena, omitting a great