

pregnated with the oil now found in them, and also how the Binny sandstone of that district got its joints and cavities filled with ozocerite or natural pitch. The Balm Well Spring, of St. Catherines, near Burdiehouse in that district, situated on the line of the great Pentland fault, and in the waters of which globules of oil are yet found, the natural gas struck in some of the bore-holes near Broxburn and the Bullion Well Spring of sulphuretted hydrogen water rising from a fissure between a volcanic plug and the sedimentary beds are other evidences of this solfataric volcanic action in this district. (1)

4th. Volcanic rocks forming vertical necks and pipes across horizontal strata and containing carbon in the pure form of diamonds are also well known to constitute in South Africa the deposits of these precious stones. These diamantiferous volcanic necks and pipes also contain large cavities filled with gaseous hydrocarbon, as pointed out by Mr. Moule. (2) Mr. Moule cites 17 of these volcanic necks situated all in one straight zone 200 miles long from the Hart River to Fauresmith. He also shows that both the diamond and the gaseous hydrocarbon are found in these necks right in the center as well as on the sides, and under the "reef" or black shales as well as above them, or as well as at the places where the vertical volcanic pipes cross these horizontal black shales, which, here also, are not only not distilled but enriched, on the contrary, in bituminous matter by the hydrocarbon emanations, gaseous remnants of which are yet found in the workings, in cavities of the volcanic neck.

5th. I now come to the hydrocarbons and carbonic acid in volcanic manifestations of to-day. Not later than a few months ago the civilized world was suddenly startled and horrified at the report that an explosion of Mount Pelée had wiped away in a few minutes the entire population of the City of St. Pierre, Martinique Island. From the accounts of the catastrophe then published, it is quite certain that a fearful blast or tornado of gases suddenly shot from the side of the volcano, asphyxiating and burning in a moment 30,000 people. Nothing else, I submit, but gas would

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(1) Trans. of the Institution of Min. Eng., Vol. XXII., pt. 3, pp. 350 and 351.

(2) Annales des Mines, 21ème livraison de 1885, pp. 237 et seq