

ever, solid hydrocarbons or petroleum, are found in veins in Peru⁽¹⁸⁾ and are mined for the vanadium they contain; these veins form lenses of "asphaltite" or solid petroleum from 0.5 inches to 22 feet wide and as much as 500 feet long, in a well-defined belt 15 miles long in the Yauli district, Peru; they are parallel and in close proximity to an obsidian intrusive dyke. In the Quespi district, Peru, there is another deposit of solid petroleum forming also a lens-shaped mass with a maximum width of 28 feet and length of 350 feet occupying one of the faults of a quartz-porphiry dyke. Similar occurrences of hydrocarbons containing vanadium and uranium have been cited by other writers⁽¹⁹⁾.

5th. • Graphite, diamond and hydrocarbons in meteorites:— It is well known that pure carbon in the form of graphite and diamond has often been found in meteorites⁽²⁰⁾, but it is not so well known that hydrocarbons have also been found in them as cited by N. V. Sokoloff⁽²⁰⁾. G. Tschermak also reports 0.85% of hydrocarbon in the meteorite which fell at Goalpara, India⁽²⁰⁾.

6th. Oil and natural gas in volcanic rocks in Europe, Africa and Mexico:—O. Silvestry⁽²¹⁾ has found both liquid oil and a solid paraffin in basaltic lavas near the volcano Etna. Similar occurrences have often been cited from other parts of Europe, as for instance in Hungary⁽²²⁾, where liquid petroleum, asphalt and bitumen are found in rhyolite tuffs, in a rhyolitic quartz-trachyte and in andesite. On the Elansdraai farm⁽²³⁾, Hopetown district, Cape Colony, South Africa, two dolerite intrusive sheets were traversed in a well between the depths of 121 and 137 feet and of 364 and 401 feet and both were found to be rich in oil in their cracks and crevices. Many other dykes and sheets of intrusive rocks in Central British South Africa are also found richly impregnated with oil.

I have myself examined similar occurrences in dolerite dykes and in calcite veins running across Upper Cretaceous strata in the State of Chihuahua, Mexico.

18. Bull. Am. Inst. Min. Eng., No. 27, March, 1909, pp. 291-316.

19. See Bull. U.S. Geol. Surv., No. 330, pp. 611-616.

20. See Bull. U.S. Geol. Surv., No. 330, p. 632.

21. Gazz. Chim. ital. Vol. 7, p. 1, 1877; Vol. 12, p. 9, 1882.

22. Trans. of the Inst. of Min. Eng., Vol. XXXV, pt. 6, p. 721.

23. Trans. of the Inst. of Min. Eng., Vol. XXXV, pt. 4, pp. 545-558.