

proceeded, the end product, anthracite, still retaining, however, some 2½ per cent. to 3 per cent. oxygen.

One hydrocarbon, namely marsh gas or methane, is known to form, during the natural decomposition of vegetation, into coals; this is the only hydrocarbon thus formed. Many other gaseous or liquid hydrocarbons may be produced by the destructive distillation of carbonaceous matter or of coals, but these have nothing to do with the carbon-compounds formed in nature by the normal geological processes, as the destructive distillation of the sedimentary strata and of its carbonizing vegetation is not a normal geological process and never took place. This is conclusively proved by all the undistilled lignite and coal beds of the sedimentary strata all over the world and by the want of coke beds in these strata.

It may be well to point out here also that coal beds, being more or less porous strata, may and no doubt have been impregnated, in places, with gaseous and liquid petroleum from extraneous sources and hence these particular beds of coal, in these places, will be found really to contain natural hydrocarbons; but these are the result of a secondary enrichment by impregnation of the original coal deposit. These cases are, however, the exception and do not in any way affect the problem, save as exceptions to prove the rule.

Petroleum Series.—The petroleum series includes all the natural hydrocarbons with the exception of the marsh gas above mentioned. These petroleum grade from natural gas into fluid crude oil or petroleum proper, into semi-fluid maltha and into viscous or solid bitumen or asphalt in their many varieties, of which such minerals as grahamite, gilsonite, elaterite, napalite, ozokerite, albertite, anthraxolite, are only a few. As the end products of the petroleum series there are good reasons, as we will see, to include both graphite and diamond, whose deposits prove that they also have had a similar inorganic origin.

A good definition of the nature of petroleum is the one of Mabery ⁽⁶⁾ as follows: "petroleum, from whatever source, is one and the same substance, capable of a simple definition:—a mixture in variable proportion of a few series of hydrocarbons, the product

6. Journ. Am. Ch. Soc., 1906, XXVIII, p. 117.