

and in another paper which I read in 1904 before the American Institute of Mining Engineers (³), and before the Franklin Institute (⁴), I entered my strong protest against this fallacy. I pointed out in these papers the solfataric volcanic origin of the natural hydrocarbons or petroleumms. Other geologists have also long ago given proofs of the inorganic origin of petroleumms, especially Berthelot, Mendeléeff, Eli de Beaumont, De Lapparent, and a number of other writers mostly French and Russian.

But it evidently takes a long time to establish definitively even simple and palpable truths in science, as may be judged from some of the recent literature on the subject (⁵) in which the derivation of the natural hydrocarbons from organic matter is either again admitted without discussion or again sought to be proved. It appears, therefore, necessary that some of the facts in the case be once more presented, and I have adopted in this paper the comparative form between coals and petroleumms, in the hope that it will bring out more forcibly and more clearly how entirely and absolutely different some of the natural carbon-compounds are to others in their nature, their mode of occurrence and their origin; and in the further hope that it will demonstrate that there are really two series of natural compounds of carbon, namely the Organic or the Coal Series, or Coals, and the Volcanic, or Petroleum Series or Petroleumms.

NATURE.

Coal Series.—The coal series includes the natural carbon-compounds grading into one another from vegetation into peat, lignite, soft coal, semi-anthracite and anthracite. The exact chemical nature and proximate constitution of the members of this series are imperfectly known and are not yet fully made out, but they are nevertheless established to be complex oxidized carbon-compounds grading from definite carbo-hydrates into carbon-compounds richer and richer in carbon and poorer and poorer in oxygen as the natural carbonizing process of vegetation

3. Trans. Am. Inst. Min. Eng., Vol. XXXV, pp. 288-297.

4. Journ. Franklin Institute, Philadelphia, 1904.

5. The Data of Geochemistry, Bulletin No. 330, U.S. Geol. Survey, pp. 619-641. See also U.S. Geol. Surv. Bull. No. 250, 265, 282, 285, 300, 309, 317, 318, and others.