

found below the Carboniferous—on the understanding that before Carboniferous time the conditions for the existence of considerable growth of vegetable matter were unfavourable and it is a geological heresy to speak of or to believe in coal beds existing in formations lower than the Carboniferous; geology teaches us that they cannot and do not exist there. How is it then that there are so many large deposits of petroleum below the Carboniferous? It could not be because there was so little vegetable or other organic matter entombed in these early strata, unless their origin is not in any way organic.

Petroleum.—If the mode of occurrence of coals is well understood, the mode of occurrence of petroleum certainly is not, and hence the great misunderstanding by so many concerning the origin of the latter. Instances are multiplying in which the natural hydrocarbons are found in emanations clearly volcanic and in igneous and volcanic rocks, that is, in places "where they have no business to be" (⁷) according to those who believe in and support the organic origin of petroleum. Nevertheless these petroleum are found often in such places and no well informed geologist can ignore this fact or refuse to take account of it. Some geologists have passed such, to them, unwelcome cases over with the remark that the petroleum in the igneous or volcanic rocks were no doubt due to the distillation of the bituminous shales cut through by the intrusions; but how can a hot rock distill or drive away a vapour into itself? Some new principles in physics would have to be discovered to permit of this explanation, which is simply a contradictory use of language and not a logical argument. It is also fallacious reasoning, a reasoning in a circle, to attribute the origin of oil to bituminous shales or to shales containing oil, that is to say to oil. In one of my previous papers (⁸) on this subject before this Institute I cited a good many instances of petroleum in volcanic emanations or in igneous or volcanic rocks, and for full particulars of these reference may be made to this publication, but I will recapitulate here what these instances prove beyond all doubt:

1st. The occurrence of graphite in igneous gneisses, granites, gabbros, pegmatite dykes and in a quartz-porphry dyke.

7. G. R. Mickle, Journ. Can. Min. Inst., Vol. VI, p. 123.

8. Journ. Can. Min. Inst., Vol. VI, 1903, pp. 73-128.