Another doctrine generally accepted is the *vegetable* origin of the great supplies possessing commercial importance. It is admitted that animal remains may be a source of petroleum to a small amount.

Again, it has been observed that every great oil-containing reservoir has below it—not always immediately below—a formation of the nature known as black bituminous shale. This is soft, easily cut with a knife, and contains a large amount of vegetable matter. Such shales are generally thought to contain quantities of remains of sea-weeds. If so, they exist in a comminuted and obscure state.

Probably a majority of geologists entertain the opinion that petroleum is produced from these black shales by a slow spontaneous distillation, through the action of the heat in the rocks. By artificial distillation, oil is readily obtained from them, and little doubt is entertained that at a comparatively low temperature, a slow natural distillation proceeds.

Observation has shown that while black shales manifest a predisposition to the production of oil, pure vegetable deposits are more fixed. Thus, from proper coal-beds no oil proceeds; but from cannel coal and coaly shales oil is spontaneously evolved, as it also is from the black shales where the vegetable matter has not attained a coaly condition. The mixture of argillaceous matter with the vegetable material seems to favor the oil-making process.

Natural gas has an origin very similar to that of petroleum. The inflammable gas now so extensively employed as a substitute for coal, is also composed, like petroleum, of carbon and hydrogen, but with a larger proportion of hydrogen. It must be derived, in a similar way, from a similar source. Petroleum, in fact, is generally associated with gas. It seems to be composed of the heavier and more fixed compounds of carbon and hydrogen—containing much carbon, while gas is a lighter compound with more hydrogen. Petroleum, however, is not a simple compound of definite composition, but a mixture, apparently of many compounds—the more fixed, like asphalt and paraffine, being dissolved in the fluids kerosene.