

of only the hot gases, vapors and waters piercing up more or less through the horizontal strata to form the salines, as in Texas and Louisiana, we see the volcanic lava cones themselves piercing up boldly through the plains. There is no doubt that these lava cores in Mexico surrounded with petroleum and other solfataric emanations are one and the same volcanic phenomenon as the vertical chimneys of salts, hot waters and hot petroleum of the Texas-Louisiana salines.

ORIGIN.

The opposite chemical nature of the members of the two series of natural carbon-compounds, namely, oxidized complex carbon-compounds for the coals and a mixture of reducing hydrocarbons for the petroleum, gives us the first hint of the surface or external origin of the coals and of the internal origin of the petroleum. Beneath the earth's surface, as is well known, there is a deficit of oxygen, and hence we find none in the natural hydrocarbons from the interior, except in the solid varieties which are the oxygenated and sulphureted residues of the other petroleum in places where they came near enough to the surface. The coals on the contrary obtained their oxygen from the atmosphere at first in their original state of vegetation, and have retained part of it during the carbonizing process to which they have been subjected.

Coal Series.—The origin of the members of the coal series from the natural decomposition of vegetable matter, either in place or drifted, is abundantly proven, and is now generally acknowledged and admitted among geologists.

Petroleum Series.—It is, however, very different in the case of the petroleum, the origin of which is still admitted by many, as a matter of fact requiring no demonstration, to be due to some unseen and unexplained decomposition of organic matter. Other geologists have discussed the subject at length and have tried to prove the organic origin of the petroleum, but not one has ever been able to point out to a single case where a petroleum production process coeval with the kingdoms of life could be witnessed in nature to-day. Some other geologists are discouraged