

town, in Western Virginia, and in Pomeroy, Ohio, it is so abundant that it has been employed for boiling down the salt water that is driven up by it with great force. In almost all the States west of New England this gas rises from springs in greater or less abundance, generally from salt springs.

Origin of these Gases.—Some of these gases, as carbonic acid, are given off most abundantly from springs in the vicinity of volcanos; and in such a case there can be no question but they are produced by decompositions from volcanic heat. When they proceed from thermal springs, there is a good deal of reason for believing that internal heat may have produced them. But where they rise from springs of the common temperature, they must generally be imputed to those chemical decompositions and recompositions that often occur in the earth without an elevated temperature. Although carbureted hydrogen may sometimes proceed from beds of coal, it may also proceed from other forms of carbonaceous matter; as from bitumen disseminated through the rocks.

SURFACE GEOLOGY.

By *Surface Geology* is meant the history of the superficial deposits which have accumulated upon the earth since the tertiary period. It is the geology of the Alluvial Period. We have already described the agencies which have produced the effects, as existing causes are adequate for the work. The facts are first stated, and then the theories.

The most general division of the superficial deposits is into Drift and Modified Drift. These may be subdivided into four periods, viz. :

I. *Drift.*

1. The Drift Period,

II. *Modified Drift.*

2. The Beach and Sea Bottom Period,
3. The Terrace Period,
4. The Historic Period.

The agencies which produced all the different forms of Alluvium were at work in each of these periods, and are still in operation. The second period, for example, embraces the time when most of the deposits formed were beaches and sea bottoms. But these accumulations have also been made in the third and fourth periods, though not so abundantly as terraces. Hence each period receives its name from the predominant form of the deposit then made.

There is a great diversity of views in relation to Surface Geology among geologists. We present the subject in the light which, after much study and observation, appears to us most probable. ✓

I. DRIFT.

Unaltered or unmodified drift is a mixture of abraded materials, such as bowlders, gravel, and sand, blended confusedly together,