

these atmospheric agencies. Perhaps, also, as a general rule, Shales contain more lime than slates, which would hasten their crumbling.

There are some Shales which alter so rapidly as to be converted into clay in a few years. These varieties are especially among the shales of coal regions, which often contain much bituminous or carbonaceous matter.

#### 6.—CLAYS.

The origin of these is similar to slates and shales, and they contain similar mixtures of silicates modified, of course, by the geological composition of the region from which the sediment has been derived.

Although some varieties of clay appear to be quite solid and firm under ground, yet they all can be mixed up with water and become more or less plastic. In this they differ from slates and shales, which do not become mixable with water unless they be previously ground to a powder.

The clays of Europe, as well as such as have been carefully examined in this country, are in almost every instance found to contain potash, and it has been shewn also that they have the property of absorbing ammonia and retaining it so firmly that it cannot be dissolved out by water.

#### C.—METAMORPHIC ROCKS.

This term is applied to those geological formations which are supposed to have had an aqueous origin, and subsequently modified in a greater or less degree by heat and other causes.

##### 1.—GNEISS.

This rock, which is largely developed in the central portions of this State, is essentially composed of quartz, felspar and mica. It differs from granite in containing usually more quartz and mica and less felspar, and in being a stratified rock; whilst granite is ranked with the igneous intrusive rocks which appear to have been forced up from great depths in a liquid form.

Although there is usually ample evidence of stratification in Gneiss, yet in some localities it has been so much altered by the joint action of heat and the intrusive forces from below, as nearly to have obliterated its stratification planes, so as to resemble granite. In certain localities the strata appear to have been bent and folded up in a very confused manner.

Examples of well developed gneiss regularly stratified may be seen in the quarries on Jones' Falls, near Baltimore, and in other parts of the same geological range.