

acquaintance with geology in the community. An amount of money much greater than is generally known has been expended in vain for the want of this knowledge.

The chemical changes which rocks have undergone since their deposition, as well as the operation of decomposing agents to which they are now exposed, properly belong to the chemistry of geology. But these points will be deferred to subsequent sections, because they will there be better understood.

SECTION III.

LITHOLOGICAL CHARACTERS OF THE ROCKS.

THE *lithological* character of a rock embraces its mineral composition and structure as well as its external aspect, in distinction from its zoological and botanical characters, which refer to its organic remains.

Rocks are deposited by water in two modes: first, as mere sediment, by its mechanical agency, in connection with gravity; secondly, as chemical precipitates from solution.

The first kind of rocks is called *mechanical* or *sedimentary* rocks; the second kind, *chemical deposits*.

As a general fact, the lower we descend into the rock series we meet with less and less of a mechanical and more and more of a chemical agency in their production.

In the fossiliferous rocks we sometimes find an alternation of mechanical and chemical deposits; but for the most part, these rocks exhibit evidence of both modes of deposit, acting simultaneously.

It is difficult to conceive how any rock can be consolidated without more or less of chemical agency, except perhaps in that imperfect consolidation which takes place in argillaceous mixtures by mere desiccation. Even in the coarsest conglomerate there must be more or less of chemical union between the cement and the pebbles.

The most common mechanical rocks are sandstones, conglomerates and shales.

When sand is cemented, the solid mass is called *sandstone*; rounded pebbles produce a *conglomerate*, or *pudding stone*; and angular fragments, a *breccia*.

Shale is regularly laminated clay, more or less indurated, and splitting into thin layers along the original lamination or planes of deposition.