

the old and new continents, some of which rise more than two miles above the present level of the sea.

It is well known that the water of the sea contains a considerable portion of common salt, and a small portion of other saline ingredients.* The average amount of salt in the ocean may be estimated at $2\frac{1}{2}$ per cent. of common salt, and $\frac{1}{2}$ per cent. of other saline compounds.

The atmosphere which surrounds the earth does not come under the attention of the geologist, except as an agent in wearing down the solid surface, by the precipitation of rain, and by change of temperature. The inequalities of the earth's surface formed by mountains and valleys afford frequent opportunities for observing that the mineral substances of which it is composed are of different kinds: in some situations, we observe strata of chalk; in others, of sandstone, or compact limestone, or beds of slate, granite, &c. It was long since known to working miners, that the different beds of mineral matter lie over each other in a regular order in certain districts, and that certain beds are always found under, and never above, other particular beds.

The first observations which may be said to have laid the foundation for a correct classification of rocks were made by the German Lehman, about the middle of the last century. He found that the lower rocks, in some of the mining districts, were distinguished from the upper rocks by their great hardness, and by their structure, which was, for the most part, either crystalline or slaty; they were also distinguished by the absence of shells and other organic remains, and by the absence of fragments of other rocks, which occur so frequently in the upper rocks or strata. He further observed, that many of the upper strata, besides containing organic remains, appeared to have been formed of fragments of the lower rocks, broken down and agglutinated together; and hence he inferred, that the lower rocks were formed prior to the creation of animals, and he gave them the name of *Primitive* or *Primary*, and distinguished the upper by the name of *Secondary*. This grand division, though too hastily formed, was of use in the infancy of the science, and induced naturalists to examine more attentively the nature and position of the rocks in different countries: and, as their observations became more extended and accurate, a more extended arrangement and classification was found necessary. Many of the earlier geologists maintained that

* The inquiry has often been made,—Whence did the sea derive its saline contents? It has been supposed by some writers that the salt in the sea has been gradually augmented by saline particles brought into it by rivers; but this cause is totally inadequate to explain the immense quantity of salt existing in the whole mass of the ocean. If the average depth of the sea be five miles, and it contain $2\frac{1}{2}$ per cent. of salt,—were the water entirely evaporated, the saline residue would form a stratum of salt more than five hundred feet in thickness covering three fifths of the surface of the globe.