

# MANUAL

OF

## ELEMENTARY GEOLOGY.

---

### CHAPTER I.

#### ON THE DIFFERENT CLASSES OF ROCKS.

Geology defined—Successive formation of the earth's crust—Classification of rocks according to their origin and age—Aqueous rocks—Their stratification and imbedded fossils—Volcanic rocks, with and without cones and craters—Plutonic rocks, and their relation to the volcanic—Metamorphic rocks and their probable origin—The term primitive, why erroneously applied to the crystalline formations—Leading division of the work.

OF what materials is the earth composed, and in what manner are these materials arranged? These are the first inquiries with which Geology is occupied, a science which derives its name from the Greek  $\gamma\eta$ , *ge*, the earth, and  $\lambda\omicron\gamma\omicron\varsigma$ , *logos*, a discourse. Previously to experience, we might have imagined that investigations of this kind would relate exclusively to the mineral kingdom, and to the various rocks, soils, and metals, which occur upon the surface of the earth, or at various depths beneath it. But, in pursuing such researches, we soon find ourselves led on to consider the successive changes which have taken place in the former state of the earth's surface and interior, and the causes which have given rise to these changes; and, what is still more singular and unexpected, we soon become engaged in researches into the history of the animate creation, or of the various tribes of animals and plants which have, at different periods of the past, inhabited the globe.

All are aware that the solid parts of the earth consist of distinct substances, such as clay, chalk, sand, limestone, coal, slate, granite, and the like; but previously to observation it is commonly imagined that all these had remained from the first in the state in which we now see them,—that they were created in their present form, and in their present position. The geologist soon comes to a different conclusion, discovering proofs that the external parts of the earth were not all produced in the beginning of things, in the state in which we now behold them, nor in an instant of time. On the contrary, he can show that they have acquired their actual configuration and condition gradually, under a great variety