

grain, and bed by bed, the new formation out of the ruins of the older, other influences were at work, sometimes, to all appearance, impeding sometimes advancing, the great work. The *Plutonic rocks*—the *igneous or eruptive rocks* of modern geology, as we have seen above, were the great disturbing agents, and these disturbances occur in every age of the earth's history. We shall have occasion to speak of these eruptive formations while describing the phenomena of the several epochs. But it is thought that the narrative will be made clearer and more instructive by grouping this class of phenomena into one chapter, which we place at the commencement, inasmuch as the constant reference to the eruptive rocks will thus be rendered more intelligible. To these are now added the section "*Metamorphic Rocks*," from the fifth edition of the French work.

The rocks which issued from the centre of the earth in a state of fusion are found associated or interstratified with masses of every epoch, more especially with those of the more ancient strata. The formations which these rocks have originated possess great interest ; first, because they enter into the composition of the terrestrial crust ; secondly, because they have impressed on its surface, in the course of their eruption, some of the characteristics of its configuration and structure ; finally, because, by their means, the metals which are the objects of human industry have been brought nearer to the surface. According to the order of their appearance, or as nearly so as can be ascertained, we shall class the eruptive rocks in two groups :—

I. The *Volcanic Rocks*, of comparatively recent origin, which have given rise to a succession of trachytes, basalts, and modern lavas. These, being of looser texture, are presumed to have cooled more rapidly than the Plutonic rocks, and at or near the surface.

II. The *Plutonic Rocks*, of older date, which are exemplified in the various kinds of granites, the syenites, the protogines, porphyries, &c. These differ from the volcanic rocks in their more compact crystalline structure, in the absence of tufa, as well as of pores and cavities ; from which it is inferred that they were formed at considerable depths in the earth, and that they have cooled and crystallised slowly under great pressure.

PLUTONIC ERUPTIONS.

The great eruptions of *ancient granite* are supposed to have occurred during the primary epoch, and chiefly in the carboniferous period. They present themselves sometimes in considerable masses, for the earth's crust being still thin and permeable, it was prepared