

CHAPTER I.

COSMICAL GEOLOGY.

Cosmogony.—It does not come within the domain of geology to investigate the origin of the universe and of solar and planetary systems. Yet such investigations are so closely associated with the origin and earliest history of the earth, that the results attained by astronomical researches have at all times exerted an influence upon the views of geologists. Visionary speculations about the beginnings of the universe and the earth were much in favour during the eighteenth century, and almost every geological work of a general character had an astronomical introduction. In the early part of the nineteenth century speculation gave place before the great discoveries that were being made in astronomical physics. The explanation given by Kant and Laplace of the origin of the universe and the solar system found general acceptance, and further speculations on cosmogony and geogeny were thought to be either unnecessary for the immediate purposes of geology as a science, or were discouraged on account of their tendency to be wholly theoretical. Thus there followed a long period during which the cosmical aspects of geology made little advance.

In the year 1871, at Brunswick, Helmholtz gave expression in a popular lecture to the current conception of the earth's origin, based upon the principles of Kant and Laplace: "Our solar system was originally a chaotic nebular ball; at the beginning, when the nebular mass extended as far as the path of the outermost planets, many millions of cubic miles could contain scarcely one gramme of mass. At the time when this nebula became separated from the nebular masses of the neighbouring fixed stars, it possessed a slow movement of rotation. The natural attraction of its parts caused the nebula to condense, and in proportion as it condensed, rotation must