

Such a history the student may aspire to work out for himself with the help of aids such as this Manual offers. In the early days of geological observation, however, sections were recorded in one district without regard to the beds in other localities, and fossils have been described or accumulated in different public museums, so that the materials have only gradually been brought together, out of which it has been attempted to write the ancient history of the rocks that compose the "crust" of the British Islands.

It may be convenient here to state that we shall endeavour, where the data permit, to give, in the first place, a short introduction which will present some idea of the stratum as a whole; then to describe its physical characteristics; the divisions into which it may be separated; the typical areas in which it may be studied; and lastly, the history of its fossil life as it is successively brought before us. And in thus arranging the matter, it is believed that the student will appreciate the results which are arrived at by a careful comparison of the life of the successive beds one with the other, as an aid in estimating the value of the physical differences between them, no less than as offering a record of the first appearance, the successive migration, or the extinction of the various groups of animals and plants which have appeared in the British areas during the past geological epochs.

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## CHAPTER I.

### STRATIGRAPHICAL OR HISTORICAL GEOLOGY—THE HISTORY OF THE FORMATION OF THE EARTH'S CRUST.

THE history of the formation of the recognisable crust of the globe, can only be learnt or arrived at by piecing together what we know of its different parts, each portion having been previously and separately investigated. This history may be read in two ways—either by investigating or tracing backwards from the *present* to the *past*, or by narrating occurrences as nearly as possible in the order in which they took place. Comparatively few parts of the earth's surface have up to the present time had their intimate structure examined or even sketched out, although probably the oldest or Palæozoic portions have received the most careful attention. Many of the events, therefore, which are believed to have occurred *contemporaneously* in different areas, may in reality have taken place in succession, and have been separated by great spaces of time, the records of which we have not yet discovered, and which probably may never be found.

The structure of the British Islands is better understood than that of any other part of the globe, and presents in the space occupied the most complete series of rocks of any known area. It may, therefore, be taken as the type of the Historical Succession of the Stratified Rocks and their associated life, through time, so far as we are enabled to penetrate back into the great past. Where other regions possess a