

# A MANUAL OF GEOLOGY, THEORETICAL AND PRACTICAL.

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## PART II.—*PALÆONTOLOGY.*

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### INTRODUCTION.

THE known portion of the earth, which is exhibited in the great masses of existing land, is composed of successive accumulations of water-formed strata, sometimes more or less altered into a crystalline or igneous condition, and frequently associated with igneous rocks. This arrangement, which is usually hidden from our view by the surface soil, is represented upon a geological map by a series of colours. Each of those colours indicates a geological formation which marks or signifies a division of geological time.<sup>1</sup> We there learn the sequence of the beds, and their relation to each other. The direction in which they extend is shown; the varying breadth of country which they cover gives some idea of the extent of their original deposition; the irregularities of outcrop exemplify the kind of denudation which they have experienced; and frequently great dislocations abruptly terminate the present known limits of the deposits.

But although a geological map conveys all this information (and much more) to the student, he soon finds, when his knowledge of the several beds becomes practical, and he tries to follow each stratum through the country, that his note-book becomes filled with data (more valuable to himself than those of any map-records) of the structure and subdivisions of the beds, and of the changes in mineral character which indicate to him differences in their modes of accumulation. He collects their fossils, and thus learns the distribution of life over portions of the ancient sea-bed in which the stratum was formed, and realises in this way something of the connection between the deposit he is examining and the strata that occur above and below.

<sup>1</sup> Consult the great series of geological maps (on the scale of 1 inch to the mile) constructed by the Geological Survey; also the Geological Map of England by Sir A. C. Ramsay; Greenough's Map of England, geologically coloured, and published under the auspices of the Geological Society; Professor A. Geikie's Geological Map of Scotland; and the Geological Map of Ireland, by J. B. Jukes.