prehend the earth's history. The science, therefore, is a historical science. It finds strata of sandstone, clayey rocks, and limestone, lying above one another in many successions; and, observing them in their order, it assumes, not only that the sandstones were made of sand by some slow process, clayey rocks of clay, and so on, but that the strata were *successively* formed; that, therefore, they belong to *successive periods* in the earth's past; that, consequently, the *lowest* beds in a series were the *earliest* beds. It hence infers, further, that each rock indicates some facts respecting the condition of the sea or land at the time when it was formed, one condition originating sand deposits, another clay deposits, another lime, — and, if the beds extend over thousands of square miles, that the several conditions prevailed uniformly to at least this same extent. The rocks are thus regarded as records of successive events in the history, — indeed, as actual historical records; and every new fact ascertained by a close study of their structure, be it but the occurrence of a pebble, or a seam of coal, or a bed of ore, or a crack, or any marking whatever, is an addition to the records, to be interpreted by careful study.

Thus every rock marks an epoch in the history; and groups of rocks, periods; and still larger groups, eras or ages; and so the eras which reach through geological time are represented in order by the rocks that extend from the lowest to the uppermost of the series.

If, now, the great beds of rock, instead of lying in even horizontal layers, are much folded up, or lie inclined at various angles, or are broken and dislocated through hundreds or thousands of feet in depth, or are uplifted into mountains, they bear record of still other events in the great history; and should the geologist, by careful study, learn how the great disturbance or uplifting was produced, and succeed in locating its time of occurrence among the epochs registered in the rocks, he would have interpreted the record, and added not only a fact to the history, but also its explanation. The history is, hence, a history of the upturnings of the earth's crust, as well as of its more quiet rock-making.

If, in addition, a fossil shell, or coral, or bone, or leaf, is found in one of the beds, it is a relic of some species that lived when that rock was forming; it belongs to that epoch in the world represented by the particular rock containing it, and tells of the life of that epoch; and, if numbers of such organic remains occur together, they enable us to people the seas or land, to our imagination, with some of the kinds of life that belonged to the ancient epoch.

Moreover, as such fossils are common in a large number of the strata, from the lowest containing signs of life to the top, — that is, from the oldest beds to the most recent, — by studying out the characters of these remains in each, we are enabled to restore to our minds, to some extent, the population of the epochs, as they follow one another in the long series. The strata are thus not simply records of moving seas, sands, clays, and pebbles, and disturbed or uplifted strata, but also of the living beings that have in