succession occupied the land and waters. The history is a history as complete as can be learned from the fossils of the life of the globe, as well as of its rock-formations; and the life-history, imperfect though it be, is the great topic of Geology: it adds tenfold interest to the other records of the rocks.

These examples are sufficient to explain the basis and general bearing of geological history.

The method of interpreting the records rests upon the simple principle that rocks were made as they are now made, and life lived in olden time as it now lives; and, further, the mind is forced into receiving the conclusions arrived at by its own laws of action. We observe that many of the common rock-strata consist of the same materials that make up the deposits of sand and gravel of sea-beaches or sand-flats, or of the clays or muds of the bottoms of estuaries or the borders of rivers, and that they are arranged in beds like the modern deposits, even have, at times, ripple-marks and other evidences of the action of water or wind; and further remark that these hard rocks differ from the loose sand, clay, or pebbly deposits simply in being consolidated into a rock; and, in other places, discover these sand-deposits in all states of consolidation, from the soft, movable sand, through a half-compacted condition, to the gritty sandstone. By such steps as these, the mind is borne along irresistibly to the conclusion that rocks were slowly made through common-place operations.

These few examples elucidate the mode of reasoning upon which geological deductions are based.

In using the present in order to reveal the past, we assume that the forces in the world are essentially the same through all time; for these forces are based on the very nature of matter, and could not have changed. The ocean has always had its waves, and those waves have ever acted in the same manner. Running water on the land has ever had the same power of wear and transportation and mathematical value to its force. The laws of chemistry, heat, electricity, and mechanics have been the same throughout time. The plan of living structures is fundamentally one, for the whole series belongs to one system, as much almost as the parts of an animal to one body; and the relations of life to light and heat, and to the atmosphere, have ever been the same as now. The laws of the existing world, if perfectly known, are consequently a key to past history.

SUBDIVISIONS OF GEOLOGY.

(1) Like a plant or animal, the earth has its *systematic external form and features*, which should be reviewed.

(2) Next, there are the *constituents of the structure* to be considered: first, their *nature;* second, their *general arrangement.*

(3) Next, the successive stages in the formation of the structure, and the concurrent steps in the progress of life, through past time.