

parts of the ocean-floor. So far as we yet know, they have no analogues among the formations of the earth's crust. They differ, indeed, so entirely from any formation which geologists have considered to be of deep-water origin as to indicate that, from early geological times, the present great areas of land and sea have remained on the whole where they are, and that the land consists mainly of strata formed of terrestrial débris laid down at successive epochs in the surrounding comparatively shallow seas.

§ ii. **Preservation of organic remains in mineral masses.**—The condition of the remains of plants and animals in rock-formations depends, first, upon the original structure and composition of the organisms, and, secondly, upon the manner in which their "fossilization," that is, their entombment and preservation, has been effected.

1. **Influence of original structure and composition.**—The durability of organisms is determined by their composition and structure.

The internal skeletons of most vertebrate animals consist mainly of phosphate of lime; in saurians and fishes, there is also an exo-skeleton of hard bony plates or of scales. It is these durable portions that remain as evidence of the former existence of vertebrate life. The hard parts of invertebrates present a greater variety of composition. In the vast majority of cases, they consist of calcareous matter, either calcite or aragonite. The carbonate of lime is occasionally strengthened by phosphate, while in a few cases, as in the horny brachiopods, in *Conularia*, *Serpula*, and some other forms, the phosphate is the chief constituent.¹¹ Next in abundance to lime is silica, which constitutes the frustules of diatoms and the harder parts of many protozoa, and is found also in the teeth of some mollusks. The integuments of insects, the carapaces of crustacea, and some

¹¹ Logan and Hunt, Amer. Journ. Sci. xvii. 1854, p. 235.