by they were raised into dry land. By this simple and obvious kind of evidence, the relative ages of different mountain-chains may be compared. In most great mountain-chains, however, the rocks have been so intensely crumpled, and even inverted, that much labor may be required before their true relations can be determined.

The Alps offer an instructive example of a great mountain system formed by repeated movements during a long succession of geological periods. The central portions of the chain consist of gneiss, schists, granite and other crystalline rocks, partly referable to the pre-Cambrian series, but some of which are metamorphosed Palæozoic, Secondary, and even older Tertiary deposits (p. 1032). It would appear that the first outlines of the Alps were traced out even in pre-Cambrian times, and that after submergence, and the deposit of Palæozoic formations along their flanks, if not over most of their site, they were re-elevated into land. From the relations of the Mesozoic rocks to each other we may infer that several renewed uplifts, after successive denudations, took place before the beginning of Tertiary times; but without any general and extensive plication. A large part of the range was certainly submerged during the Eocene period under the waters of that wide sea which spread across the centre of the Old World, and in which the nummulitic limestone and flysch were deposited. But after that period the grand upheaval took place to which the present magnitude of the mountains is chiefly due. The older Tertiary rocks, previously horizontal under the sea, were raised up into mountain-ridges more than 11,000 feet above the sea-level, and, together with the older formations of the chain, were crumpled, dislocated and inverted. So intense was the compression and shearing to