

more than once to move inland the poles upon which their large boats were set, and the old poles still remain beneath the water as silent witnesses of the change.*

The probable cause of the movements above alluded to, whether of elevation or depression, will be more appropriately discussed in the following chapters, when the origin of subterranean heat is considered. But I may remark here, that the rise of Scandinavia has naturally been regarded as a very singular and scarcely credible phenomenon, because no region on the globe has been more free within the times of authentic history from violent earthquakes. In common, indeed, with our own island, and with almost every spot on the globe, some movements have been, at different periods, experienced, both in Norway and Sweden. But some of these, as for example during the Lisbon earthquake in 1755, may have been mere vibrations or undulatory movements of the earth's crust prolonged from a great distance. Others, however, have been sufficiently local to indicate a source of disturbance immediately under the country itself. Notwithstanding these shocks, Scandinavia has, upon the whole, been as tranquil in modern times, and as free from subterranean convulsions, as any region of equal extent on the globe. There is also another circumstance which has made the change of level in Sweden appear anomalous, and has for a long time caused the proofs of the fact to be received with reluctance. Volcanic action, as we have seen, is usually intermittent: and the variations of level to which it has given rise have taken place by starts, not by a prolonged and insensible movement similar to that experienced in Sweden. Yet, as we enlarge our experience of modern changes, we discover instances in which the volcanic eruption, the earthquake, and the permanent rise or fall of land, whether slow or sudden, are all connected. The union of these various circumstances was exemplified in the case of the Temple of Serapis, described in the last chapter, and we might derive other illustrations from the events of the present century in South America.

Some writers, indeed, have imagined that there is geological evidence in Norway of the sudden upheaval of land to a considerable height at successive periods, since the era when the sea was inhabited by the living species of testacea. They point in proof to certain horizontal lines of inland cliffs and sea-beaches containing recent shells at various heights above the level of the sea.† But these appearances, when truly interpreted, simply prove that there have been long pauses in the process of upheaval or subsidence. They mark eras at which the level of the sea has remained stationary for ages, and during which new strata were deposited near the shore in some places, while in others the waves and currents had time to hollow out rocks, undermine cliffs, and throw up long ranges of shingle. They undoubtedly show that the movement has not been

* See Proceedings of Geol. Soc., No. 42, p. 208. I also conversed with Dr. Pingel on the subject at Copenhagen in 1834.

† Keilhau, Bulletin de la Soc. Géol. de France, tom. vii. p. 18.