

1749, was found after 87 years to be 100 feet nearer the water's edge.<sup>226</sup> The west coast of Greenland, for a space of more than 600 miles, is perceptibly sinking. It has there been noticed that, over ancient buildings on low shores, as well as over entire islets, the sea has risen. The Moravian settlers have been more than once driven to shift their boat-poles inland, some of the old poles remaining visible under water.<sup>227</sup> Historical evidence likewise exists of the subsidence of ground in Holland and Belgium.<sup>228</sup> On the coast of Dalmatia, Roman roads and villas are said to be visible below the sea.<sup>229</sup>

§ 3. **Causes of Upheaval and Depression of Land.**—These movements must again be traced back mainly to consequences of the internal heat of the earth. There are various ways in which this cause may have acted. As rocks expand when heated, and contract on cooling, we may suppose that, if the crust underneath a tract of land has its temperature slowly raised, as no doubt takes place round areas of nascent volcanoes, a gradual uprise of the ground above will be the result. The gradual transference of the heat to another quarter may produce a steady subsidence. Basing on the

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<sup>226</sup> According to Erdmann, the subsidence has now ceased, or has even been exchanged for an upward movement (*Geol. För. Stockholm Förhandl. i. p. 93*). Nathorst also thinks that Scania is now sharing in the general elevation of Scandinavia (*ibid. p. 281*). It appears that the zero of movement now passes through Bornholm and Laaland.

<sup>227</sup> These observations, which have been accepted for at least a generation past (*Proc. Geol. Soc. ii. 1835, p. 208*), have recently been called in question, but the alleged disproof is not convincing, and they are here retained as worthy of credence. See Suess, *Verhand. Geol. Reichsanstalt, 1880, No. 11*, and "Antlitz der Erde," ii. p. 415 *et seq.*

<sup>228</sup> Besides the paper of Lorié, quoted on p. 491, consult Lavaleye, "Affaissement du sol et envasement des fleuves, survenus dans les temps historiques," Brussels, 1859. Grad, *Bull. Soc. Geol. France, ii. 3d ser. p. 46*. Arends, "Physische Geschichte der Nordseeküste," 1833. Compare also R. A. Peacock on "Physical and Historical Evidences of vast Sinkings of land on the North and West Coasts of France," etc., London, 1868. For submerged peat-beds on French coast, see A. Gaspard, *Ann. Soc. Geol. Nord, 1870-74, p. 40*. On oscillations of French coast, T. Girard, *Bull. Soc. Geograph. Paris, ser. 6, vol. x. p. 225*; E. Delfortrie, *Act. Soc. Linn. Bordeaux, ser. 4, vol. i. p. 79*.

<sup>229</sup> *Boll. Com. Geol. Italiano, 1874, p. 57*.