

mark the area of origin of the shock. By this means, Mallet computed that the depth at which the impulse of the Calabrian earthquake of 1857 was given was about five miles. As the general result of his inquiries, he concluded that, on the whole, the origin of earthquakes must be sought in comparatively superficial parts of the crust, probably never exceeding a depth of 30 geographical miles. Following another method of calculation, Von Seebach computed that the earthquake which affected Central Europe in 1872 originated at a depth of 9.6 geographical miles; that of Belluno in the same year was estimated by Höfer to have had its source rather more than 4 miles deep; while that of Herzogenrath in 1873 was placed by Von Lasaulx at a depth of about 14½ miles, and that of 1877 in the same region at about 14 miles.¹⁷⁹

Geological Effects.—These are dependent not only on the strength of the concussion but on the structure of the ground, and on the site of the disturbance, whether underneath land or sea. They include changes superinduced on the surface of the land, on terrestrial and oceanic waters, and on the relative levels of land and sea.

1. **Effects upon the soil and general surface of a country.**—The earth-wave or wave of shock underneath a country may traverse a wide region and affect it violently at the time, without leaving permanent traces of its passage. Blocks of rock, however, already disengaged from their parent masses on declivities, may be rolled down into the valleys. Landslips are produced,

¹⁷⁹ See papers by Höfer and A. von Lasaulx, cited on p. 463. For an account of the various methods employed in estimating the depth of origin of earthquakes, see Milne's "Earthquakes," chapters x. and xi. Consult also the *Trans. Seismolog. Soc. Japan*.