dustan, 656 feet in a second.<sup>178</sup> The most accurate measurements and computations of the velocity of earthquake movements are probably those made by Prof. J. Milne and his associates in Japan. The rates of movement during the Tokio earthquake of 25th October, 1881, are estimated to have ranged between 4000 and 9000 feet per second. As the result of prolonged observation, Prof. Milne concludes that "different earthquakes, although they may travel across the same country, have very variable velocities, varying between several hundreds and several thousands of feet per second; that the same earthquake travels more quickly across districts near to its origin than it does across districts which are far removed; and that the greater the intensity of the shock, the greater is the velocity." <sup>174</sup>

Duration.—The number of shocks in an earthquake varies indefinitely, as well as the length of the intervals between them. Sometimes the whole earthquake only lasts a few seconds; thus the city of Caracas, with its fine churches and 10,000 of its inhabitants, was destroyed in about half a minute; Lisbon was overthrown in five minutes. But a succession of shocks of varying intensity may continue for days, weeks, or months. The Calabrian earthquake, which began in February, 1783, was continued by repeated shocks for nearly four years until the end of 1786.

Modifying influence of geological structure.-In its pas-

<sup>&</sup>lt;sup>173</sup> K. von Seebach, "Das Mitteldeutsche Erdbeben von 6 März, 1872," Leipzig, 1873. Höfer, Sitzb. Akad. Wien, Dec. 1876; A. von Lasaulx, "Das Erdbeben von Herzogenrath, 22d Oct., 1873," Bonn, 1874. "Das Erdbeben von Herzogenrath, 24 Juni, 1877," Bonn, 1878. G. C. Laube, on Earthquake of 31st January, 1883, at Trautenau, Jahrb. Geol. Reichs. 1883, p. 331. H. Credner, on the Earthquakes of the Erzgebirge and Vogtland from 1878 to 1884, Zeitsch. für Naturwiss. vol. lvii. (1884). F. Wähner, on Agram earthquake of 9 Nov. 1880, Sitz. Akad. Wien, lxxxviii. (1883), p. 15. Di Rossi, "Meteorologia Endogena," i. p. 306; P. Serpieri, Instituto Lombardo, 1873. <sup>174</sup> "Earthquakes," p. 94.