with the normal augmentation of temperature downward due to secular cooling, and the conclusion drawn therefrom by Sir William Thomson. Mr. Darwin further concludes from his hypothesis that the ellipticity of the earth's figure having been continually diminishing, "the polar regions must have been ever rising and the equatorial ones falling, though as the ocean followed these changes, they might quite well have left no geological traces. The tides must have been very much more frequent and larger, and accordingly the rate of oceanic denudation much accelerated. The more rapid alternation of day and night[33] would probably lead to more sudden and violent storms, and the increased rotation of the earth would augment the violence of the trade-winds, which in their turn would affect oceanic currents." [34] As above stated, no facts yet revealed by the geological record compel the admission of more violent superficial action in former times than now. But though the facts do not of themselves lead to such an admission, it is proper to inquire whether any of them are hostile to it. It will be shown in Book VI. that even as far back as early Palæozoic times, that is, as far into the past as the history of organized life can be traced, sedimentation took place very much as it does now. Sheets of fine mud and silt were pitted with rain drops, ribbed with ripple-marks, and furrowed by crawling worms, exactly as they now are on the shores of any modern estuary. These surfaces were quietly buried under succeeding sediment of a similar kind, and this for hundreds and thousands of feet. Nothing indicates violence; all the evidence favors tranquil deposit.[35] If, there-

[33] According to his calculation, the year 57,000,000 of years ago contained 1300 days instead of 365.

[34] Op. cit. p. 532.

[35] Sir R. Ball (Nature, xxv. 1881, pp. 79, 103), starting from Prof. Darwin's