

culuation based on the wearing down of our continents, which appears to proceed at the rate of about a foot in four or five thousand years, and on the time required to deposit the sediments of the several geological formations, estimated at about 70,000 feet in thickness. These calculations would give us, say, eighty-six millions of years since the earth began to have a solid crust, which would, like Lord Kelvin's earlier estimate, give us nearly fifty millions of years for the geological time since the introduction of life. The details of the several estimates made it would be tedious and unprofitable to enter into, but I may state as my own conclusion, that the modern rates of denudation and deposit must be taken as far below the average, and that perhaps the estimate stated by Wallace on data supplied by Houghton, namely, twenty-eight millions, may be not far from the truth, though perhaps admitting of considerable abatement.

This reduced estimate of geological time would still give scope enough for the distribution of animals and plants, but it will scarcely give that required by certain prevalent theories of evolution. When Darwin says, "If the theory (of natural selection) be true, it is indisputable that before the lowest Cambrian stratum was deposited long periods elapsed, as long as, or probably far longer than, the whole interval from the Cambrian to the present day," he makes a demand which geology cannot supply; for independently of our ignorance of any formations or fossils, except those included in the Archæan, to represent this vast succession of life, the time required would push us back into a molten state of the planet. This difficulty is akin to that which meets us with reference to the introduction of many and highly specialized mammals in the Eocene, or of the forests of modern type in the Cretaceous. To account for the origin of these by slow and gradual evolution requires us to push these forms of life so far back into formations which afford no trace of them, but, on the contrary,