

lieve that the Tasmanians or the Bushmen are the originals of humanity; but may rather conclude that they are degraded races produced by banishment to less congenial abodes than the original home of the species in the Palearctic region.

The discussion of the distribution of animals and plants, when carried on in the light of geology, raises many interesting questions as to time which we have already glanced at, but which deserve a little more attention. As to the vast duration of geological time all geologists are agreed, and recently the advocates of evolution have even exceeded the geologists in such demands. It is, however, now well understood that science sets certain limits to the time at our disposal. Edward Forbes humorously defined a geologist to be "an amiable enthusiast who is content if allowed to appropriate as much as he pleases of that which other men value least, namely, past time:" but now even the geologist is obliged to be content with a limited quantity of this commodity, and Wallace has the credit of being the first biological evolutionist who has boldly faced this difficulty.

The well-known estimate of Sir William Thomson gives one hundred millions of years as the probable time necessary for the change of the earth from the condition of a molten mass to that which we now see. On this estimate we might fairly assume fifty millions of years as covering the time from the Laurentian age to the modern period. Other physicists, however, reasoning on the constitution of the sun, would greatly reduce this time, and even confidently affirm that "twenty millions of years ago the earth was enveloped in the fiery atmosphere of the sun."¹ Geology itself has attempted an independent calculation 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 Sir William Thomson's estimate, give us nearly fifty millions of years for the geological time since the introduction of life. In revising these calculations a few years ago I was

¹ Newcomb, Helmholtz, Tait, etc.