

keeps our great sun, so to speak, alive, and prevents it from rapidly growing cold.

It used to be believed that our earth, not so very long ago geologically speaking, was too hot to support life. As one descends into the earth, the temperature rises, and the temperature gradient has been measured. From a knowledge of the temperature gradient, it could be calculated how long a period of time must have elapsed since the surface of the earth was too hot to sustain life. The calculation made by Lord Kelvin was about 40,000,000 years; but with this estimate geologists were not satisfied. They said that for the accumulation of the stratified rocks they could not do with a day less than 100,000,000 years. Now it has been found that the earth-crust contains a vast amount of radio-active substances: these are all the while giving out heat. The cooling of the earth, if it were ever once molten, must have been lengthened by the presence of these substances. There is no physical reason why the earth should not be many hundreds of millions of years old. Indeed, it has been suggested by Professor Joly that the earth may actually be getting hotter instead of colder; and analyses of radio-active minerals, made by Strutt, point very strongly to the conclusion that the solid earth has been in existence for at least 750,000,000 years.

The world—every kind of world—is kept going by energy. The discovery of atomic energy is a marvelous thing owing to its immense amount, and its vast importance to the history of our earth, our sun and all the heavenly bodies. At present, as Soddy has called it, this is the "Age of Coal." We are using up the forgotten sunshine of past ages, collected during millions of years, at a great pace—spending our capital of energy to a large extent careless of the future. But in the course of a few generations the day of reckoning for what has been called "our black and nervous civilization" must come. When coal is exhausted, unless some new source of energy is found, great cities like Birmingham and London, Paris and Berlin, New York and Montreal, and the city of Winnipeg, will not be able to exist. At present there is a race between the rate of exhaustion of the capital of the world's energy and the advance of science which may enable us to discover the