

foraminifera have yet been detected in the overlying eocene beds. The explanation of this is that the break in the life of these two periods represents an incalculable lapse of time. The cretaceous area was elevated and its fauna emigrated; when it was again depressed the lapse of time was so great that the life which immigrated then from neighbouring seas was composed of new forms. Indeed, the eroded character of the cretaceous rock upon which the tertiary was laid down would in itself prove the great lapse of time.

But "the imperfection of the Geological Record" accounts for only some of the causes of "imperfection of the Palaeontological Record," for, if the series of sedimentary rocks had been preserved to us in its entirety and open to our inspection, there would yet be the deficiencies owing to (1) the facility with which different animals may be preserved as fossils, (2) the liability to be deposited where they may be preserved, and, finally, (3) the liability to be obliterated or destroyed after being deposited.

To the varied facility with which different animals may be preserved as fossils, enormous deficiencies in the palaeontological record are due. In the polyzoa, coelenterata, anneloida and annulosa a large proportion, comprising entire classes possess no hard parts, and consequently are unrepresented as fossils, and even in the mollusca and vertebrata some families are lost to us through the same cause. Birds, owing to their lightness, float after death on the water until devoured, and mammals, the majority of which live on land, have fewer opportunities of being buried in aqueous accumulations, consequently are not so often represented as those forms which are essentially marine.

In addition to these is the disappearance of fossils from rocks originally fossiliferous. Metamorphism or the subjection of the rock to a sufficient heat to cause rearrangement of the particles, and consequently an obliteration of the fossils, is the chief cause to which we have to look for the irreparable loss of an enormous mass of palaeontological evidence. The life of the great Laurentian series of rocks comprising 30,000 feet (say 6 miles) in thickness of sediments, has been entirely blotted out by this cause. Another cause of obliteration is the percolation of water holding carbonic acid (rain water, for instance) through sand or loose rock.