

denuded by their abrupt invasion. The phenomenon has been sudden but brief, like the upheaval of the mountain or chain of mountains, which is presumed to have been the cause of it; but it was often repeated: witness the valleys which occur in every country, especially those in the neighbourhood of Lyons and of the Durance. These strata indicate as many successive deposits. Besides this, the displacement of blocks of minerals from their normal position is proof, now perfectly recognisable, of this great phenomenon.

There have been, doubtless, during the epochs anterior to the Quaternary period of which we write, many deluges such as we are considering. Mountains and chains of mountains, through all the ages we have been describing, were formed by upheaval of the crust into ridges, where it was too elastic or too thick to be fractured. Each of these subterranean commotions would be provocative of momentary irruptions of the waves.

But the visible testimony to this phenomenon—the living proofs of this denudation, of this tearing away of the soil, are found nowhere so strikingly as in the beds superimposed, far and near, upon the Tertiary formations, and which bear the geological name of *diluvium*. This term was long employed to designate what is now better known as the “boulder” formation, a glacial deposit which is abundant in Europe north of the 50th, and in America north of the 40th, parallel, and re-appearing again in the southern hemisphere; but altogether absent in tropical regions. It consists of sand and clay, sometimes stratified, mixed with rounded and angular fragments of rock, generally derived from the same district; and their origin has generally been ascribed to a series of diluvial waves raised by hurricanes, earthquakes, or the sudden upheaval of land from the bed of the sea, which had swept over continents, carrying with them vast masses of mud and heavy stones, and forcing these stones over rocky surfaces so as to polish and impress them with furrows and striæ. Other circumstances occurred, however, to establish a connection between this formation and the glacial drift. The size and number of the erratic blocks increase as we travel towards the Arctic regions; some intimate association exists, therefore, between this formation and the accumulations of ice and snow which characterise the approaching glacial period.

As we have already stated at the beginning of this chapter, there is very distinct evidence of two successive deluges in our hemisphere during the Quaternary epoch. The two may be distinguished as the *European Deluge* and the *Asiatic*. The two European deluges occurred prior to the appearance of man; the Asiatic deluge