

The glacier-system appears to have taken in America the same gigantic proportions which other objects assume there. Nor is it necessary, in order to explain the permanent existence of this icy mantle in temperate climates, to infer the prevalence of any very extraordinary degree of cold. On this subject M. Ch. Martins thus expresses himself: "The mean temperature of Geneva is $9^{\circ} 5$ Cent. Upon the surrounding mountains the limit of perpetual snow is found at 8,800 feet above the level of the sea. The great glaciers of the valley of Chamounix descend 5,000 feet below this line. Thus situated, let us suppose that the mean temperature of Geneva was lowered only 4° , and the average became $5^{\circ} 5$; the decrease of temperature with the height being 1° c. for every 600 feet, the limit of perpetual snow would be lowered by 2,437 feet, and would be 6,363 feet above the level of the sea. We can readily admit that the glaciers of Chamounix would descend below this new limit, to an extent at least equal to that which exists between their present limit and their lower extremity. Now, in reality, the foot of these glaciers is 5,000 feet above the ocean; with a climate 4° colder, it would be 2,437 feet lower; that is to say, at the level of the Swiss plain. Thus, the lowering of the line of perpetual snow to this extent would suffice to bring the glacier of the Arve to the environs of Geneva. . . . Of the climate which has favoured the prodigious development of glaciers we have a pretty correct idea; it is that of Upsal, Stockholm, Christiana, and part of North America, in the State of New York. . . . To diminish by four degrees the mean temperature of a country in order to explain one of the grandest revolutions of the globe, is to venture on an hypothesis not bolder than geology has sometimes permitted to itself."*

In proving that glaciers covered part of Europe during a certain period, that they extended from the North Pole to Northern Italy and the Danube, we have sufficiently established the reality of this *glacial period*, which we must consider as a curious episode, as well as certain, in the history of the earth. Such masses of ice could only have covered the earth when the temperature of the air was lowered at least some degrees below zero. But organic life is incompatible with such a temperature; and to this cause must we attribute the disappearance of certain species of animals and plants—in particular, the Rhinoceros and the Elephant—which, before this sudden and extraordinary cooling of the globe, appear to have limited themselves, in immense herds, to Northern Europe, and chiefly to Siberia, where their remains have been found in such prodigious quantities.

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