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the valleys. Meanwhile the northern regions of the continent. which may have inaugurated, submitted extendedly to the same phenomena. Glacial ice, first made on elevations, finally formed at, and poured over lower levels. Glacial streams finally united to form an icy sea whose frozen waters slowly plowed the surface of the rocks; and whose waves, in their movement from north to sonth, absorbed the local glaciers in their course, and extended over all physical barriers into the Sonthern States and down the Valley of the Mississippi. To the main Ice-sheet, the Appalachians and Rocky Mountains are supposed to have contributed their local glaciers. Before this frozen deluge the animals must have always retreated. The existing insects of the pliocene must, in submitting to the change of climate which accompanied the advance of the glacier, have quitted their haunts with reluctance, and undergone a severe struggle for existence, no matter how gradually they had been prepared for the encounter. We must expect that multitudes of specific forms ultimately perished of whose remains no traces have been preserved.

Such being a brief statement of the outlines of the opening of the Glacial Epoch, we turn to some facts offered by a study of our existing species of butterflies and moths. The tops of the White Mountains and the ranges of mountain elevations in Colorado, offer us particular kinds of these insects living in an isolated manner at the present day and confined to their respective localities. In order to find insects like them we have to explore the plains of Labrador and the northern portion of the North American Continent, in regions offering analogous conditions to those obtaining on the summits of these mountains. The genera Oeneis and Brenthis among the butterflies, and Anarta and Agrotis among the moths, are represented by the same or similar species in all of the above mentioned localities. In the case of the White Mountain Butterfly, Oeneis semidea, we have a form sustaining itself on a very limited alpine area on the top of Mount Washington.¹ Although there is some doubt that precisely

¹ See Mr. Sendder's article in the "Geology of New Hampshire," 1,342. Mr. Seudder first pointed out the existence of alpine and subalpine faunal belts on Mount Washington, and interestingly remarks " that if the summit of Mt. Washington were somewhat less than two thousawd feet higher it would reach the limit of perpetual snow." Consult also, an earlier paper of great value by Dr. A. S. Packard, Jr., on "The Insect Fauna of the Summit of Mount Washington as compared wit: that of Labradov" (these Proceedings, Vol. XVI, 151). Dr. Packard, in comparing the climate of the two localities, says t "The seasous correspond very exactly, as the snew mells in the early summer, and lee is formed early in the autumn at about the same dates."

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