

to revive. But other trials have fully confirmed Lister's observations. My friend, Mr. Stickney, the author of a valuable 'Essay on the Grub' (larva of *Tipula oleracea*)—to ascertain the effect of cold in destroying this insect, exposed some of them to a severe frost, which congealed them into perfect masses of ice. When broken their whole interior was found to be frozen; yet several of these resumed their active powers. Bonnet had precisely the same result with the pupæ of *Papilio brassicæ*, which, by exposing to a frost of  $14^{\circ}$  R. below zero ( $0^{\circ}$  F.), became lumps of ice, and yet produced butterflies. Indeed, the circumstance that animals of a much more complex organization than insects, namely, serpents and fishes, have been known to revive after being frozen, is sufficient to dispel any doubts on this head."

In Burmeister's "Manual of Entomology" the above instances are also referred to, though at much less length; but, as no additional facts are adduced, it is unnecessary to quote from his work.

The above would seem sufficient to establish the proposition that some insects can survive freezing, and, indeed, when one remembers that insects successfully maintain their existence in the most arctic lands which have ever been visited by man, it seems strange that anyone should ever have questioned it. Is it conceivable that these tiny creatures, when in a state of lethargy and partaking of no nourishment, could successfully resist yielding to frost in regions subject to a temperature of  $75^{\circ}$  F. below zero, and where in summer the soil only thaws to the depth of twelve or fifteen inches, the ground below this depth being perpetually frozen?

The meteorological tables of the English arctic expedition of 1875-6 show that the mean temperature of the winter months at the stations of the two vessels, "Alert" and "Discovery", varied from  $5^{\circ}$  F. below zero in October, and  $17^{\circ}$  F. below zero in April, to  $40^{\circ}$  F. below zero in the middle of the winter, and that the minimum temperatures reached were:— $73\frac{3}{4}^{\circ}$  F. at the winter quarters of the first named vessel, and  $-70.8^{\circ}$  F. at the station of the latter in Discovery Bay.

In spite of these terrible temperatures the naturalists attached to the expedition were very successful, and Mr. Robert McLachlan, F. R. S., to whom the collections of insects were submitted, wrote as follows in his