

others it occurs—some wintering in the perfect state alone, some 'in the larva and the imago condition, and others as larva and pupa.

Many of the species appear to make some preparation, retiring to situations that will more or less protect them from intense cold ; others seem to have power to survive without any practical protection, as *Lixus concavus* and *Megilla maculata*, to be mentioned further on.

The majority are apparently subject to conditions that correspond to what is observed in warm blooded animals in a state of complete torpidity, namely : the absence of all detectable respiration ; a temperature equal to that of the surrounding atmosphere till near the freezing point, and the power to survive a long entire deprivation of air, and even submersion in carbonic acid gas. There is no well substantiated case, that I have seen, of any of the above class reviving after a few hours submergence in water, except in that of certain swallows washed from their winter quarters in the low banks of streams by freshets ; and while some of these appear to have resumed the functions of life partially, none have been resuscitated completely.

Many, if not all Coleoptera in the hiemal state in whatever stage, possess this latter power in an eminent degree, as is very evident from observations on the effects of winter inundations, as in the instance following. In February, 1884, a section of bottom land over one mile in length and one quarter in width, was entirely overflowed by the Allegheny to an average depth of five feet, and remained totally submerged over seven days. This is famous ground for Cicindelidæ and Carabidæ. Thousands of *C. repanda* are on the shore from April till November. *Carabus vinctus*, *Platynus melanarius*, *picipennis*, *extensicollis* and *anchomenoides* ; *Pterostichus lucublandus*, *Sayi* and *luctuosus* ; *Anisodactylus discoideus*, *Baltimorensis*, &c., &c., abound.

To all appearance no terrestrial life could survive such a protracted submergence, which over a considerable portion of this area was even a week longer ; and yet, when the warm days of April came, here was *C. repanda* as numerous as ever ; later appeared the various species of Carabidæ, many with the elytra encrusted with mud ; and all kinds of insects seemed as abundant as in seasons in which no brumal overflow had occurred.

*Lachnosterna futilis*, which abounds in grassy places along the bank, was in no wise affected ; nor was *Saperda concolor*, which inhabits the canes of a dwarf willow.