

Dr. John Hamilton, of Alleghany, Pa., on the other hand, found, as related in his interesting paper in CAN. ENT., XVII., p. 35, that he could not revive specimens of Coleoptera which were unquestionably frozen, though some larvæ inclosed in cylinders of ice were still found to be flexible, and regained activity on a rise of temperature.

Though Dr. Hamilton's experience was decidedly against the theory that actual freezing does not necessarily cause death in insects, he still admits that a good deal of evidence has been adduced on the other side, and that records of the survival of frozen insects cannot be summarily dismissed.

To turn to some of the older writers on entomology, I may quote the following from Kirby & Spence's "Introduction to Entomology", Vol. II., second edition. On page 231, after referring to some very extraordinary instances of the survival of insects under such trying circumstances as immersion in gin for twenty-four hours, and immersion in boiling water, the authors say: "Other insects are as remarkable for bearing any degree of cold. Some gnats that De Geer observed survived after the water in which they were was frozen into a solid mass of ice: and Reaumer relates many similar instances." Later, on pages 452-3 of the same volume, in treating of "Hibernation of Insects" I find the following very interesting remarks: "But, though many larvæ and pupæ are able to resist a great degree of cold, when it increases to a certain extent they yield to its intensity and become solid masses of ice. In this state we should think it impossible that they should ever revive. That an animal whose juices, muscles and whole body have been subjected to a process which splits bomb shells, and converted into an icy mass that may be snapped asunder like a piece of glass, should ever recover its vital powers, seems at first view little less than a miracle; and, if the reviviscency of the wheel animal (*Vorticella rotatoria*) and of snails, etc., after years of desiccation, had not made us familiar with similar prodigies, might have been pronounced impossible; and it is probable that many insects when thus frozen never do revive. Of the fact, however, as to several species, there is no doubt. It was first noticed by Lister, who relates that he had found caterpillars so frozen that when dropped into a glass they clinked like stones, which nevertheless revived. Reaumer, indeed, repeated this experiment without success, and found that when the larvæ of *Bombyx ptyocampa*, F., were frozen into ice by a cold of 15° R. below zero (2° F. below zero), they could not be made