

the constant term, one making the temperature two or three degrees lower than the other. Edes does not say that the temperatures were read from a standard tested thermometer, and the discrepancy noted was just such as might be expected from the use of incorrect thermometers.

II.—STATEMENT OF PROBLEM AND METHOD.

To test the formulas of Dolbear and Bessey, I counted the chirps of several crickets, and from them computed the temperatures. Finding that the computed temperatures were sometimes considerably in error, I undertook a series of observations to determine (1) whether the discrepancy was to be found in any very large proportion of the crickets, and if so, (2) to discover, if possible, the cause of the discrepancy.

These observations were made on *Æcanthus niveus* in Ann Arbor, Mich., in the level country near New Carlisle, Ohio, and on the hillsides of Ithaca, N. Y., in the summers of 1905 and 1906. At first all observations were made with the insect in view. Lantern in hand, I cautiously approached the point in the bushes from which the sound issued until the chirping insect was discovered and the chirps found to coincide with the motion of the wings. The crickets were not at all disconcerted by this procedure, and often permitted me to approach within two feet.

After having observed some 75 specimens by means of a lantern, I found that chirping crickets were rarely closer together than three or four feet, and hence that an individual could easily be picked out by sound. Thereafter I relied upon sound alone for the determination of rates. Of the observations made with a lantern, the only one recorded in the following pages is the one mentioned in the discussion as having chirped 2,228 times in succession. An ordinary watch was used in timing, and to minimize the error, each count was continued through several minutes. Temperature readings were taken within a few minutes of making the count, and all readings were made from the same thermometer. This thermometer was afterward compared with a tested thermometer, by immersing them simultaneously in vessels of water at various temperatures, and was found to have a constant error of about half a degree within the range of temperatures recorded below. Corrections have accordingly been made in these readings before entering them in the tables. The thermometer read to degrees, and fractions of degrees were estimated. The length of one degree on the scale was such that for an eye trained in estimating fractions of lengths the error should in any case have been less than one-tenth of a degree.

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