## THE CANADIAN ENTOMOLOGIST.

one. Hence, its graphical representation is not a line, nor even a surface. Of the other possible factors in addition to temperature, it has been shown that wing-length is of no effect in determining the rate of chirping. The remaining two factors which have been studied, namely, humidity and individuality, are, with temperature, sufficient to explain most of the observed facts. However, in fig. 15 there remains still one point to be explained. That point is the crossing of the curves of the individual crickets. The external factors of temperature and humidity have been eliminated by having them practically the same for both crickets. Individuality has not served to keep the curves separate throughout their length. Here some other factor, either external or internal, must enter. The most plausible explanation seems to be that based on differences of physiological state, which, of course, could not be determined from my observations. It is quite possible that physiological condition (age, hunger, sexual condition, etc.), plays an important role. It may well so have affected "rate individuality" as to have caused the crossing of the two curves plotted in fig. 15.

The synchronism found by Dolbear does not appear in my observations. As a rule, even neighbouring crickets chirp at rates that are very noticeably different. The instance of synchronism recounted above throws some light on the question, which by implication Edes (1899) raises, as to whether synchronism is due to the effect upon various individuals of equal temperatures or other conditions. It seems from my observation that synchronism may possibly be due rather to the effect of each cricket's chirp upon the other cricket.

Dolbcar may have gained his impression of universal synchronism by observing a sporadic case of it or by actually listening to but one cricket and mistaking it for a full chorus. The intensity of sound diminishes so rapidly with increasing distance from the source, that with but one cricket chirping several feet away and the others at a greater distance an observer could easily overlook those at the greater distance. One cricket, if undisturbed, will usually perform six to eight hundred chirps without missing one, except on cool nights. Not infrequently it will perform 1,500 in succession ; while one "long-winded" individual which I observed continued through 2,640, another 2,425, a third 2,228. From these figures it will be seen that breaks in the series of chirps might escape observation, and that the continuous chirping of one performer might be mistaken for a chorus in which the single crickets were not missed when they dropped out. It would thus happen that a single cricket may have been mistaken for several in unison, each performing less continuously.