

It is impossible to determine how long such subruderal formations have persisted. The size and thoroughness of establishment of *Gutierrezia* and *Artemisia* would indicate occupation for several decades. After a long period, however, it usually happens that *Stipa comata*, driving out the subruderal inhabitants, reconquers these trails. It is significant that the dark patches of *Opuntia humifusa*, or *O. polyacantha* so characteristic of this formation, never reappear with the *Stipa*. But even the speargrass is unable to resist the modifying influence of the trail, and its abnormally tall stems and compact growth find easy interpretation in connection with the ruts and ridges on which it grows. The old California trail is the most interesting example of this. Throughout the upper valley of the North Platte in Nebraska, this historic overland route is marked by such a zonal formation. From the base of Scott's Bluff, the California trail, first travelled more than three-score years ago, and abandoned for over a score of years, "angles" southeastward in a broad band of innumerable ruts, painfully insistent in their matted cover of bleaching grass-stems.

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## THE CRICKET AS A THERMOMETER.

BY A. E. DOLBEAR.

An individual cricket chirps with no great regularity when by himself and the chirping is intermittent, especially in the day time. At night when great numbers are chirping the regularity is astonishing, for one may hear all the crickets in a field chirping synchronously, keeping time as if led by the wand of a conductor. When the numbers are so great, the resting spells of individuals are unnoticed but when the latter recommence they not only assume the same rate but the same beat as the rest in that field. The crickets in an adjoining field will have the same rate, that is, will make the same number of chirps per minute, but with a different beat as one may easily perceive by listening.

The rate of chirp seems to be entirely determined by the temperature and this to such a degree that one may easily compute the temperature when the number of chirps per minute is known.

Thus at 60° F. the rate is 80 per minute.

At 70° F. the rate is 120 a minute, a change of four chirps a minute for each change of one degree. Below a temperature of 50° the cricket has no energy to waste in music and there would be but 40 chirps per minute.

One may express this relation between temperature and chirp rate thus.

Let  $T$ . stand for temperature and  $N$ , the rate per minute.

$$T.=50+\frac{N-40}{4}$$

For example. What is the temperature when the concert of crickets is 100 per minute?

$$T.=50+\frac{100-40}{4}=65^{\circ}.$$

#### EDITOR'S TABLE.

—ONE of the most important advances based upon scientific researches is now under discussion in Boston. The Associated Boards of Health of Massachusetts now advocate the licensing of every person engaged in the milk business, the licenses only to be granted after the thorough inspection of the locations of the business and the sources of the supply, even to an examination of the cows. Within the past year several severe epidemics of typhoid fever in and near Boston have been traced to milk supplies, and the very source of infection found. Only a few years ago milk was looked upon as the very safest drink and food for mankind, but one has only to consider the facts brought out by Prof. W. T. Sedgwick in his report upon milk to the Associated Boards of Health to see that we must sooner or later come to some governmental supervision in this matter, for as the case now stands in our cities, milk is about the most dangerous substance that enters our houses.

—EVERY one who reads the foreign journals is frequently gratified by the praise they accord to our government publications. Typo-