

kind is indicated by any observations last night, though a few of the meteor tracks (perhaps five or six in all) would not pass strictly through the radiant if traced back. C. A. YOUNG.

Princeton, N.J., Nov. 28.

### A bright meteor.

On Friday, Nov. 13, about 10.30 A.M., the attention of a number of our students was attracted by a brilliant meteor.

The appearance as described by Mr. H. Toulmin, of the senior class, is as follows: The path of the meteor began 15° or 20° west and north of the zenith, following a north-westerly direction, and ending some 20° from the horizon.

The brightness he compares to that of Venus when seen at night. The sun was shining brightly, and no clouds were noticed. No explosion was heard, nor did any fragments seem to reach the ground.

C. L. DOOLITTLE.

Lehigh university.

### Absorption of mercurial vapor by soils.

Last year considerable attention was excited by the proposition to utilize the insecticide properties of mercurial vapor against the phylloxera or vine-louse. This suggestion originated with Mr. J. A. Bauer, a druggist of San Francisco, and himself the owner of a vineyard in the infested region of the Napa valley, where he had for some years experimented on the efficacy of mercury, and satisfied himself of its usefulness as a preventive of infection, when, in planting, each cutting was surrounded by a few inches of earth mixed with 'deadened' mercury. Upon publication of the fact, a considerable demand for the mercurial mixture (consisting of equal parts of finely divided mercury and clay or chalk) was made by persons interested, and many thousand vines were treated in different localities in the manner prescribed by Mr. Bauer. This was to mix thoroughly about a peck of earth with an ounce of the above mixture, and fill in with it the hole in which the cutting has been placed, to the depth of at least six inches from the surface. Many experiments were also made on vines already infested, to see if the mercury would gradually spread so as to disinfect the whole of the root system.

Contrary to expectation, most of these experiments proved a failure, inasmuch as the phylloxera seemed to continue, unchecked, on the roots already infested, and in some cases clean cuttings had become infested, despite the surrounding mercurialized soil.

Having witnessed a number of the successful experiments upon which Mr. Bauer's recommendations were based, I undertook an investigation of the circumstances of the reported failures, and soon discovered two that were essential. One was that the mercury used was considerably contaminated with lead, which is known to diminish exceedingly the evaporation of mercury; another, that oil had been used in order to facilitate the 'deadening' process, and thus each globe was covered with a film that additionally impeded volatilization. In fact, the iodine test for mercurial vapor showed that a mere trace of the latter existed around the mixture furnished by Mr. Bauer, while a similar one prepared with pure mercury showed abundant volatilization at the ordinary temperature, and acted very promptly upon insects.

Yet, upon using the latter mixture in the manner prescribed by Mr. Bauer, in a very clayey soil, neither the insects nor the iodine test manifested the presence of mercurial vapor. It was now remembered that Mr. Bauer's successful experiments had been made in a very sandy soil of the city of San Francisco; and the inference was plain, that, just as aqueous vapor would be absorbed to a much greater extent by a clay soil than by sand, so the mercurial vapor was at first absorbed by the former until saturation was reached, which might not be for many weeks or even months; the soil acting as an effectual disinfectant until supersaturated.

Experiments proved this surmise to be correct; and the investigation, still in progress, seems to show that the capacity of soils for the absorption of aqueous vapor may serve as an approximate measure of their relative capacity for the absorption of mercurial vapor also. Thus in pure sand, which in a saturated atmosphere at 15° C. absorbed only .5 per cent of aqueous vapor, the amount of mercurial vapor absorbed was too small for analytical determination; while in a clay soil, absorbing, under the same conditions, 6 per cent of watery vapor, the mercurial vapor retained at 49° C. amounted to .012 per cent, equivalent to about 130 grains per cubic foot of soil. Now, since from one-fourth to one-half cubic foot was used in the treatment of vines, it follows that from 33 to 65 grains of metal out of the 240 used in each case, would have to evaporate and impregnate the soil, before any free vapor would be available for action on the insects. At the low temperature of the soil this would naturally take a considerable length of time: hence the failures.

It is of course perfectly feasible to insure this impregnation beforehand by exposing the mercurialized soil to a higher temperature (e.g., to that of 49° C., easily attained in California by exposure to the sun) for ten or twelve hours, or for a much shorter time to steam-heat. A clay soil so prepared will act on the phylloxera as promptly as when sand is used; all being dead, or incurably poisoned, within from 20 to 30 hours.

The method is therefore far from being a failure, as has been industriously represented by interested parties. It will accomplish all that has ever been claimed for it; to wit, the preservation of young vineyards from infection through the ingress of the phylloxera from above; and, as there is no occasion for disturbing the earth immediately surrounding the stock of a vine, there is no reason why this protection should not continue for all the time the vine is likely to live. With proper precautions, it will also, no doubt, be available against other insect pests of similar habits; e.g., the 'woolly aphis' (*Schizoneura lanicera* Hausm.). The conditions for successful application in practice in various cases are still under investigation.

E. W. HILGARD.

Agric. exper. station, Berkeley, Cal.,  
Nov. 28.

### The English sparrow.

Your correspondent in *Science*, No. 147, asks for information in regard to the English sparrows. In this city (Cincinnati) and vicinity there are large numbers of these birds, and local ornithologists have no hesitation in saying they drive away the native songsters.

At my house, in one of the thinly populated suburbs,