

THE LEONIDS OF 1900.

BY JOHN A. MILLER.

The number of Leonids observed this year was very much smaller than was anticipated. Doubtless many escaped notice because of the bright moonshine and cloudy weather. Still, bearing these facts in mind, the shower was very disappointing. The *totale* of observations tend to confirm Dr. Johnstone Stoney's prediction that, owing to planetary perturbations, the stream bearing these meteors would not come nearer the earth this year than one and a half million miles.

On the mornings of November 14th and 15th my colleague, Mr. W. A. Cogshall, and myself, aided by our students, observed these meteors in order to obtain data concerning—

- (a) The frequency of fall.
- (b) The radiant.
- (c) Duration of visibility; and
- (d) The height at which the meteors appeared and disappeared.

On both mornings the sky was cloudy until three o'clock, and parts of it were overcast even after that time. Hence our observations for frequency are of small value. However, from 3:52 to 4:22 on the morning of the 14th our observers counted thirteen meteors. These came from the neighborhood of Leo, but were probably not all Leonids. At no other time were meteors so frequent as then. It was a source of remark, however, that they seemed to fall in groups two or three. That is, when one appeared one or two others followed at short intervals.

We attempted to obtain a sufficient number of trails of the meteors, photographically, to determine a radiant, but were unsuccessful. Our visual observations for the same purpose were more fruitful. On the morning of the 14th 45 meteor trails were platted; 13 of these were Leonids. On the morning of the 15th 41 were platted; 17 of which were Leonids. The radiant obtained from these paths was at the point whose right ascension is 149° and whose declination is 21° .

A Bergström chronoscope was employed to measure the duration of visibility. This instrument measures time accurately to the thousandth of a second, which is much less than the error introduced by the observer

in pressing the telegraphic key which registers the appearance and disappearance of the meteor. The average of the results obtained for the duration of visibility is 0.6 second.

In order to secure the parallax of the meteors observations were made at Bloomington and at Bedford. The co-ordinates of these stations are, for Bloomington, longitude $86^{\circ} 32' 11''$, latitude $39^{\circ} 10'$; for Bedford, longitude $86^{\circ} 39' 10''$, latitude $38^{\circ} 52'$. The distance (rectilinear) between the two stations is 33.652 meters, equaling 20.13 miles.

An examination of our charts and recorded times showed that of all the meteors platted only one had been observed simultaneously at both stations.

Using the method of Klinkerfues, we found that the height of the meteor at the time of apparition was 143 miles, and its height at the time of its disappearance was 64 miles.

MOSQUITOES AND MALARIA.

BY ROBERT HESSLER.

[Abstract.]

The recently developed theory that mosquitoes are the carriers of malaria from one man to another, which is based on the definitely ascertained cause of malaria, is a question of considerable importance to inhabitants of malarial districts, such as we have, for instance, along the Wabash River.

Speaking of Indiana, especially when compared with former times, it may be said that malaria has lost its terrors. To see what the disease really is requires a visit to such a region as the desolate Roman Campaigna, or to the Isthmus of Panama. The ravages of the disease, known about Rome as Pontine fever and at Panama as Chagras fever, is something terrible to contemplate.

Popularly it is generally believed that the drainage of wet areas and of stagnant waters is the cause for the great diminution in the number of cases and of its severity among us.

For a cause, biologists and physicians always want something tangible—a something that can be seen, felt, weighed or measured; a something