after leaving Ontario rather than that they fell, but evidence is not sufficient to finally determine the question.

THE SPEED OF THE METEORS

As the meteors were seen at places nearly 2500 miles apart it might be supposed that by obtaining the times when they were seen at the two extremes of this distance we could easily deduce the speed. But the entire time consumed in travelling this distance was very short, perhaps 4 or 5 minutes, and the times observed are not accurate enough to be used for this purpose. The time at which the phenomenon was seen is given as the same all along the line — 7 o'clock (M.T.) in Saskatchewan, 9 o'clock (E.S.T.) in Ontario, and 10 o'clock (Atl. T.) in Bermuda.

In my request for information I asked for estimates of the time during which a single body was visible. These varied all the way from 6 to nearly 60 seconds, but the ordinary values are from 20 to 30 seconds. From several persons in Toronto who observed the phenomenon I obtained estimates of the angle traversed during this time, varying from 120° to 135°.

Now at Toronto an angle of 120° would be subtended by 160 miles, and an angle of 135° by 192 miles of actual path. If traversed in 30 seconds this would give speeds of $5\frac{1}{3}$ and $6\frac{2}{5}$ miles per second, respectively. If the time taken was 20 seconds, the speeds would be 8 and $9\frac{1}{5}$ miles per second, respectively.

The first value, $5\frac{1}{3}$ miles per second, is probably too low. A body travelling close to the earth's surface as a satellite would perform a revolution in 84 minutes, or at the rate of 5·0 miles per second. This result is obtained on the assumption that the body is travelling in a vacuum. The bodies under consideration, though moving comparatively slowly, as their reddish color attested, were travelling in the atmosphere, and would surely have been brought to earth during their observed course if their speed had been so near that of a satellite in a vacuum. But, as we have seen, all observers agree in saying that the path was practically parallel to the earth's surface. I am inclined to

believe that the speed with respect to the earth's surface was greater than 5 and less than 10 miles per second.

Of course the velocity in space was greater. When seen the bodies were travelling largely in the direction of the earth's orbital motion, and also with the rotational motion of the earth.

THE SOUNDS HEARD AND THE DURATION OF THE DISPLAY

On the map (Figure 1) I have indicated those places at which sounds were heard, and it will be seen that they extend to a considerable distance from the path of the meteors. Those farthest away are Edgar,* 78 miles from the actual path in one direction and Cayuga, 33 miles in the other.

In some localities a shaking of the earth or of the buildings was detected. In the neighborhood of Shelburne this was especially noticeable. At Keldon Mr. Wm. Anderson "felt a slight tremor in the floor," and on going outside heard a rumbling noise, reminding him of a slight earthquake. A man living three miles farther west was in bed at the time and was awakened by the sound, and fearing that his horses were wrecking the stable got up to investigate, — only to find them perfectly quiet. I have learned of several in Toronto who detected the quivering of the house and remarked it at the time, among them being Mrs. and Miss Davis, of Poplar Plains Road. Many others heard the sounds.

In the Niagara peninsula these effects were very pronounced. At Niagara-on-the-Lake the windows rattled, and at St. Davids Rev. G. Munro heard the sound and looked in vain up in the sky to see the cause of it.

The sound has been compared to low distant thunder, to a wagon passing over hard rough roads or over a bridge, to the report of small arms in a sham battle at a distance; and a lady at Canfield likened it to the crashing together of two railway

* Dr. Jamieson, who reported from Edgar, did not hear the sounds himself but stated that others had. Several observers in Barrie did not hear the sounds. The places next farthest from the meteors where sounds were heard are, Unionville, 51 miles, and Jackson, 49 miles.