

Letters to the Editor.

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The Aurora of October 15, 1926, in Norway and Sounds Associated with it.

SOME curious phenomena accompanying the splendid aurora of Oct. 15, 1926, were observed by me. On the night in question I was working as observer of international determinations of longitude at the top of a hill named Voxenaasen in the neighbourhood of Oslo (approximate altitude, 470 metres). I was at work in a field observatory with a transit instrument registering star transits and chronometer beats for time determinations, when an initial aurora attracted my attention. My assistant was Mr. G. Jelstrup, electrotechnical student.

I was able, during intervals between my observations of time and polar stars, to observe the aurora, which was certainly one of the most splendid I had ever seen. But what is of preponderant interest is the following fact: When, with my assistant, at 19<sup>h</sup> 15<sup>m</sup> Greenwich Civil Time, I went out of the observatory to observe the aurora, the latter seemed to be at its maximum: Yellow-green and fan-shaped, it undulated above, from zenith downwards—and at the same time both of us noticed a very curious faint whistling sound distinctly undulatory, which seemed to follow exactly the vibrations of the aurora.

The sound was first noticed by me, and upon asking my assistant if he could hear anything, he answered that he noticed a curious increasing and decreasing whistling sound. We heard the sound during the ten minutes we were able to stay outside the observatory, before continuing our observations.

From 20<sup>h</sup> 1<sup>m</sup> to 20<sup>h</sup> 6<sup>m</sup> (Greenwich Civil Time) we registered on our radio-receiving set the rhythmic time-signals from the LY station (Bordeaux). We secured the whole series of tops—but at the same time the 'aurora statics' disturbed the pen of the registering instrument. The impulses thus registered are of varying strength, and each of them is of course exceptionally well determined in time, being 'received' at the same time as the scientific time signals. I therefore think that they may be of some interest. The maximum impulses of 'aurora statics' and their duration were:

| No.     | Greenwich Civil Time.                              | Duration.          |
|---------|--|--------------------|
| 1 . . . | 20 <sup>h</sup> 4 <sup>m</sup> 28 <sup>s</sup> .60 | 0 <sup>s</sup> .08 |
| 2 . . . | 20 <sup>h</sup> 4 <sup>m</sup> 29 <sup>s</sup> .49 | 0 <sup>s</sup> .10 |
| 3 . . . | 20 <sup>h</sup> 4 <sup>m</sup> 39 <sup>s</sup> .90 | 0 <sup>s</sup> .25 |
| 4 . . . | 20 <sup>h</sup> 4 <sup>m</sup> 40 <sup>s</sup> .50 | 0 <sup>s</sup> .25 |

As regards the intensity of these impulses, I find that in each case the vertical component was greater than 100 microvolt/metre.

When, after the reception of the time signals, we again went out of the observatory, the curious sound had absolutely ceased, and later in the night, when also the aurora had vanished, we noticed that the atmosphere was as if swept clean from statics and disturbances of our wave-length.

Concerning the curious sound, I would only remark that the weather was absolutely calm when it was heard. As regards our antennæ system, it may be said that it consists of 5 strands of 40 metres each. Our receiver set is an aggregate, consisting of a

three-circuits tuner, two high-frequency valves, one modulator, one heterodyne, four low-frequency valves, relay and chronograph.

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Astronomer to the Norwegian  
Geographical Survey.

Oslo (Norway), Dec. 1, 1926.

To the above most interesting communication from M. Jelstrup I may add the following:

On Oct. 15 I had the aurora stations at Bygdö, Oslo, Oscarsborg, Tömte, and Kongsberg in action from about 18<sup>h</sup> Greenwich Civil Time to about 2<sup>h</sup> on the following morning, and photographs were taken all the time from single stations, and from two or three stations simultaneously. About 70 successful photograms for the determination of height were secured.

Only a few of these have as yet been measured and calculated, and they show the ordinary heights of the

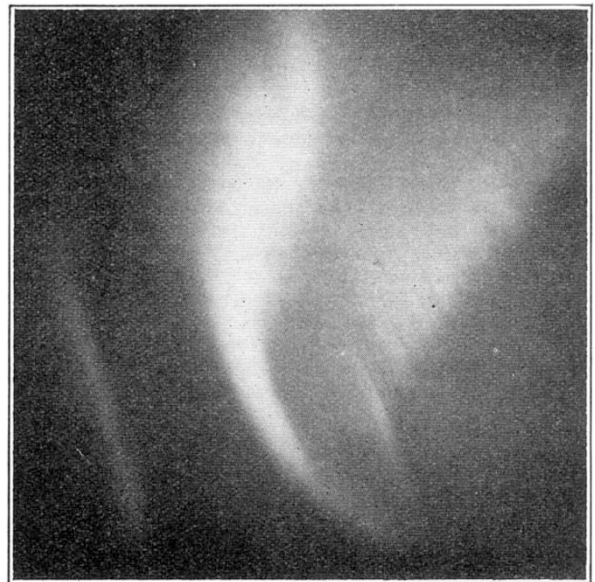


FIG. 1.—Aurora curtains photographed on Oct. 15.

aurora, from 90 kilometres to more than 400 kilometres. Fig. 1 shows one of the best photographs of curtains at 19<sup>h</sup> 5<sup>m</sup> 46<sup>s</sup>, taken from Oslo to the west. The simultaneous photograph of the left curtain was from 124 to 131 kilometres above the earth, the middle curtain from 103 to 114 kilometres, and of the right from 110 to 132 kilometres.

During the period from 19<sup>h</sup> 15<sup>m</sup> to 19<sup>h</sup> 25<sup>m</sup> when M. Jelstrup heard the whistling of the aurora, I regret that no successful photographs were taken. From the visual observations made simultaneously at Bygdö by the meteorologist Röstad, who helped me during the work, I quote the following:

19<sup>h</sup> 10<sup>m</sup>. Dense masses of rays and curtains down to the horizon in E. and S.E.

19<sup>h</sup> 12<sup>m</sup>. The same down to the horizon in W., to the polar star in N., to the horizon in E., and down to 40° over the horizon in S.

19<sup>h</sup> 14<sup>m</sup>. The same to the Great Bear in N.

19<sup>h</sup> 16<sup>m</sup>. The same in the N. and S. down to 15° over the horizon. Red in S.

19<sup>h</sup> 21<sup>m</sup>. Strong diffuse arc through Can. venat. from the horizon in N.W. to the horizon in N.E.

19<sup>h</sup> 24<sup>m</sup>. Pulsating aurora begins.