Dec. 9th, 1946
213 W. Seminary Ave.
Wheaton, Illinois

Mr. K. A. Norton
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Bureau of Standards
Washington, D.C.

Dear Mr. Norton:

Thank you for your letter of Nov. 29th. I am afraid the solar phenomenon we witnessed on the 21st is not connected with hydrogen flares as it has not put in its appearance since even tho the flares were present.

If you will recall, the pointer on the small meter on the panel danced around considerably; at times it would momentarily rise and fall back. The sound in the fones at such times was much like a "swish". In the background was the strong hissing or rushing noise, and the great swishes momentarily rose above the background.

When the apparatus was turned away from the sun the phenomenon did not disappear completely. While the background hiss dropped down into the receiver and auto noise, the swishes could still faintly be heard and the recorder pen indicated them to be present. At the time I thought that this energy was merely scattered radiation from buildings etc.

Events of the following night cast some doubt on this scattering hypothesis. Since auto noise is greatly reduced at night the gain was turned up about 30 times over that used during the day. When things quieted down toward midnight I noticed the pen was making sharp vertical marks about an inch long at irregular intervals. On the chart these spikes looked like the results of lightning in the distance. While the weather was cloudy, no rain was falling and no thunder could be heard.

Putting on the headphones I expected to hear a pop or snap whenever the pen went up. Instead I heard a swish just like previous noon, only much fainter. These swishes occurred at intervals from a second to several minutes. Each swish lasted only a quarter second of less. I estimate these night time swishes to be about 70 to 90 DB below those heard at the peak at noon. The swishes continued all night, decreasing in frequency but not in amplitude toward morning and disappearing into the auto noise about 700AM. Quite a few of the swishes were accompanied by very faint grinding sounds having noise components near 300cps. No snapping or cracking could be heard which might be interpreted as an electric spark of any kind.

After thinking this over I got out the chart taken on the night following Oct 17th. This chart showed the same type of markings, only less frequent and the whole business died out about 400AM. My log book showed it to be raining that night, so the markings were attributed to lightning altho none was seen. An entry indicates "no thunder was heard during the night so where was the lightning?" The following morning it was still raining so the whole thing was forgotten at that time. In the light of more recent events I believe the markings on this chart were really caused by swishes and not lightning.

It is my guess the great burst we witnessed was really generated in the earths atmosphere by particles of some kind which probably came from the sun.

An exchange of telegrams with Southworth produced the information that solar measurements were made at 1¼ cm wavelength on the 21st and nothing unusual was observed.

On the 23rd the solar intensity was about 25% below that of the 22nd and 24th. This, no doubt, was caused by the moon obscuring 25% of the suns disk at noon here during the eclipse.

After you left I went over the noise factor calculations. The data was for a 1:1 signal to noise ratio of 113DB.

113DB = 2.24×10^{-6} volt
50 ohm dummy antenna
$E^2/R = 10 \times 10^{-14}$ watt

K = 1.38×10^{-23} watt sec / deg.
T = 300 degrees
B = 10×10^{6} cps.
KTB = 4.14×10^{-14} watt

Thus E^2/R is 2.42 times or 3.8DB above KTB which is a reasonable figure.