

GR  
February 2, 1948

14.5/904

Dr. J. S. Hey  
Operational Research Group  
Ministry of Supply  
London, SW 15  
England

Dear Dr. Hey:

We have recently received a copy of ORG report #355, which describes an excellent piece of work.

The subject of the variations of intensity from the region of Cygnus is very important. When you first announced this observation a year or so ago, I critically examined all my 160 Mc charts. If any variations existed either long or short term they were less than 5%. More recently I have examined my 480 Mc charts with the same result. All these data were taken near vertical incidence as Cygnus goes practically through the zenith at Wheaton.

Dr. Pawsey of N.S.W. has been visiting us and we have discussed the subject at some length. He has conducted a number of very fine experiments using Lloyd's mirror technique over the sea. Thus his data are secured near grazing incidence. At 60 Mc he finds random variations of 2 to 1 which are quite pronounced on some days and nearly lacking on others. At 200 Mc he finds much smaller variations at quite infrequent times.

One possible explanation of the findings is that the energy from Cygnus is absorbed or deviated from its course in an irregular manner by the ionosphere. Since the ionosphere is quite churned up at times and rarely exhibits the smooth uniform layer of simple theory, this sort of conditions might easily exist and be more pronounced at 60 Mc than at 200 Mc.

A critical test might be made by arranging to follow Cygnus from rising to its highest altitude continuously on days exhibiting a variety of ionospheric conditions. 60 Mc would be preferable to 200 Mc as apparently no high angle measurements have ever been made at this frequency. Your report states that you were considering revising your equipment so that it could be tipped up to  $35^\circ$ . While this would be helpful, even greater elevation is desirable. We would like to know if you are making or expecting to make such a test on the variations of intensity from Cygnus versus altitude of the constellation.

Mr. J. S. Hey  
London, SW 15, England

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Any current information on this subject will be appreciated by us as we believe it to be a matter of sufficient importance to warrant investigation, if the experiment has not already been made.

Very truly yours,

Grote Reber, Radio Physicist  
Experimental Ionospheric Research Section  
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