

BELL TELEPHONE LABORATORIES

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463 WEST STREET NEW YORK 14

CHELSEA 3-1000

IN REPLY REFER TO

Box 107, Red Bank, N. J.
February 19, 1945-1630-GCS-MGM

REPLYING TO

MR. GROTE REBER
212 West Seminary Ave.
Wheaton, Illinois

Dear Mr. Reber:

I want to thank you for your letter of February 17, offering certain suggestions relative to my paper entitled: "Microwave Radiation from the Sun". I have sent along to the publisher a list of changes that incorporate most of your suggestions. Certain of them are of a kind that can be made even if the text is already set up in type. Perhaps others as for example those in Fig. 2 will have to be accepted. Fortunately, the latter are of minor importance. I have also added a short section for the particular benefit of the general reader. It tells in a general way what is meant by black-body radiation.

I am not quite certain that I follow you in your argument as to why I did not observe cosmic static. Perhaps I am in error in my own reasoning in this regard. I have assumed that if, for a given frequency, I had increased the directivity of my antenna beginning with an antenna of fairly low directivity I should have received progressively more energy from the sun up to a point where the angular diameter of the antenna pattern corresponds to the angular diameter of the sun. I may rationalize this by saying that the increase in directivity has called for a larger antenna and hence more wave power has been intercepted. Or if I prefer, I may say that, as directivity has been improved, the effective temperature of the space into which the antenna looks has been increased. That is to say, the sun's disc occupies a proportionately larger part of the total space seen by the antenna. Proceeding beyond this point, I assume that the angular diameter of the sun becomes larger than that of the receiver and no further increase in effective temperature ensues unless by chance we should observe hot spots on the sun.

I assume that the Milky Wave is a large target of this kind both for your antenna and for my antenna but possibly not for Jansky's antenna. If so, the effective temperature for your case and for mine are essentially the same and any

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differences in our respective received levels should reflect mainly the variation of cosmic radiation with frequency. Perhaps you should amplify your ideas somewhat beyond those set forth in the second paragraph of page 2 of your letter.

Very sincerely yours,

G. C. Southworth
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