July 18th, 1947
212 W. Seminary Ave.
Wheaton, Illinois

Dr. J. L. Pawsey
Radiophysics Laboratory
University Grounds
Chippendale, N.S.W.
Australia

Dear Dr. Pawsey:

Thank you for your letters of May 7th and 28th.

Yes the situation on solar intensity at 160mc is rather confused. The figure I gave in my 1944 Ap. J. article is the equivalent of the sun spread out over the entire acceptance cone of my antenna. If this energy is concentrated into a disk $\frac{1}{2}^o$ in diameter, the apparent temperature of the disk is about one million degrees as you deduce. Southworth's figure of 6000° is no doubt a misinterpretation of my 1944 data.

When we wrote the Observatory article I went over my calculations and found two systematic errors of about 2:1 each. These counterbalanced each other on the data from the milkyway so the 1944 Ap.J. figure stands correct. However only one of these errors appeared in the solar calculations; thus the 1944 Ap.J. figure is low by about 2:1.

My best estimate of the 1943 background intensity of the sun at 160mc calls for an apparent temperature of about 1.8×10^6 degrees from a disk $\frac{1}{2}^o$ in diameter. If the radiating area of the disk is larger, the apparent temperature will be proportionately less.

From my more recent experiments at 480mc I have a hunch that the radiating size of the sun is really between 0.7 and 1.0 degree in diameter at 160mc.

At 160mc I took about 50 traces on random days during the period from Sept. 1943 to Feb. 1944. While the accuracy was not high and variations of 15% or 20% could have been overlooked, no great outbursts were found such as are now being observed.

I am enclosing a print giving results of my 480mc measurements. The ordinate is in volts. A level of 0.25 volt represents about 10^6 degrees from a disk

$\frac{1}{2}^{o}$ in diameter in the sky.   This data represents
substantially all the 480mc solar data which has been
secured here at Wheaton as only random days of
observation have been carried out since June 1st.

You will probably be interested to know that I
am now associated with the Central Radio Propagation
Laboratory of the National Bureau of Standards,
Washington, D.C. They are undertaking a large
program of solar and cosmic noise measurement. By
good fortune I have been chosen to carry out the work
under their auspices. At present we are in the process
of moving my machinery to their field station at
Sterling, Virginia which is about 36 miles west of
Washington. We have also secured the parts for three
mirrors and mountings from German Giant Wurzburg radars.
These we are in the process of rehabilitating and
altering to operate on a polar mounting. Continuous
solar intensity measurements from sunrise to sunset
will be made using logarithmic scales on the recorders.
The frequencies will probably be 160mc, 480mc and 1410mc
as electronic equipment is presently available for
these.

For the time being you can get me at either the
Wheaton, Illinois or the Washington, D.C. address. If
you are able to make a trip to this country I will be
pleased to show you our equipment, results and discuss
any phases of the subject which may interest you.

We are collaborating with A. E. Covington of the
National Research Council of Canada at Ottawa. He is
presently making continuous recordings of solar
intensity at 2800mc. It is our feeling that this
field of astronomical radio is very important, but we
cannot do everything. Consequently we wish to keep in
touch with other organizations working in this field
to prevent useless duplication of effort, there is
plenty of room for all.

We would be much interested in having you people
make solar recordings at about the same frequencies
mentioned above. Since you are about 180° of longitude
from us, a nearly continuous watch on the sun could
then be maintained. If you have a sizeable amount of
day-to-day solar intensity data at any frequency over
the last year, we would appreciate receiving a copy in
tabular form. At the Bureau we have a couple of men
interested in statistical correllation and they are

anxious to secure as much information to base their
calculations on as possible.   Just what will be found
out from their efforts is not known. However, since
I am not much for that kind of business, I believe it
should be encouraged in others. Up to date Mine and
Covingtons data is all they have to work upon, so any
other will be very welcome. You may be assured we
will forward their findings to you as they are secured.

     With best wishes for your continued success in
this line of endeavour, I am

                              Very truly yours,

                              Grote Reber