



## COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANIZATION

## DIVISION OF RADIOPHYSICS

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20th March, 1950.

Dr. G. Reber,  
Officer in Charge of Radio Astronomy,  
National Bureau of Standards,  
Washington. 25. U.S.A.

Dear Reber,

Stanley showed me your letter to him of January 17th enquiring about the discrete source technique. He is a junior partner in the Bolton, Stanley, Slee combination and is sending your letter on to Bolton to reply in detail but is sending you a copy of his paper on this subject which has been submitted to the Australian Journal of Scientific Research (A).

I shall not attempt to reply in detail to your questions but it may help your planning if I tell you something of the research in cosmic noise going on here. When I visited you the story was that Bolton alone was working on this subject and concentrating on the discrete sources.

The present position is that we now have three small groups on observational work - Bolton, Stanley and Slee working on the cliffs at 100 Mc/s. and working progressively up in frequency. They have been interested in both discrete sources and general distribution; Mills and Thomas who are attempting precision measurements on the discrete sources at 100 Mc/s. using the alternative two aerial technique (like Ryle's), and Shain who is doing exploration at low frequencies, 20 Mc/s, (starting on general distribution). The latter two are at the stage of having taken preliminary measurements and are getting better gear but have no publications yet. The work of the former over the past few years is covered by their three papers, Parts 1, 2 and 3, of which I enclose 1 and 3. Stanley is sending you Part 2.

You will see that Bolton got onto the spiral galaxy idea which you discussed with me. Actually he arrived at it quite independently from his measurements but I told him of your search for this evidence and I think he has acknowledged your original speculation.

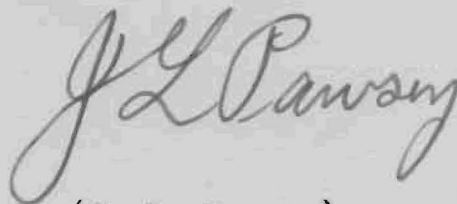
I shall also add a few remarks on my own perspective concerning methods of investigating cosmic noise. The cliff-top method has the great advantage of the cut-off below the horizon. It is therefore the best for initial exploration. But its accuracy and even applicability is severely limited by variable refraction effects which we do not yet understand - (we say glibly "ionospheric effects"). These are very troublesome at 100 Mc/s. and presumably worse at lower frequencies. On the shorter

wavelengths we find another trouble - the roughness of the sea spoils reflection. We use the open ocean (25 cm. results are hopeless). The two aerial method is more complicated but I think that the difficulties can be overcome and if so it will easily win in precision. The main hope of overcoming the difficulties, calibration in particular, is in getting certain identification of a few of the discrete sources.

The Crab Nebula is the firmest of the present three but I hope soon to see a few more (Mills and Thomas). We can help one another very materially in this respect if we inform each other of any reasonably certain identifications. At 100 Mc/s. incidentally, "ionospheric effects" are smaller than on the "cliff-edge" method but not negligible. There is also a major difficulty in interpretation of records where several sources produce interfering patterns. We at present use common sense and low cunning but there may be better methods. This difficulty is, of course, worse on the two aerial method.

I have been wondering about the progress of your work in Washington. Did you ever get the grand parabola you hoped for? We have only seen the short articles on solar noise disturbances and the N.B.S. contribution to the Quarterly Bulletin of Solar Activity which Dr. Allen edits.

Please remember me to Bateman and Herbstriet and the rest of your group - with very best wishes,



(J. L. Pawsey)

Enc. Galactic Radio Frequency Radiation, Parts 1 and 3.

(Stanley is writing separately enclosing Part 2.)