

Phillips House  
Massachusetts General Hospital  
Boston, Massachusetts  
4 July 1962

Dr. P. A. G. Scheuer  
Radio Physics Laboratory  
CSIRO  
University Grounds  
Sydney, Australia

Dear Peter:

The second phase of my illness has been a devastating business, but I am pleased to say that a silver lining is now shining through. For quite a while I was very depressed, partly as the direct effects of the operation, partly from sheer hospital life, and also from the fact that I have been substantially crippled over this period. However, Dr. Sweet's opinion is that in a reasonably short period I shall be able to live a reasonably normal life, and if this eventuates the plan is that I should go ahead with the directorship of Greenbank as originally planned. The actual time schedule is a little doubtful, but Dr. Sweet is now talking of my leaving the hospital for a convalescence period in a week or so. If things work out reasonably, I should then be able to return to Australia some time in the winter and wind up my affairs there, returning to Greenbank in the northern autumn. The purpose of this letter is to ask if you could help me in the development of a project in which I am very interested. The writing was prompted by the fact that I have just replied to the Cambridge request for a reference on your behalf for the position which you asked me to act as referee. I may say that I gave you a very good character and if the other referees do the same I am sure you will have a high probability of getting the job.

Now the project in which I should like your help is the one of which we spoke while in Sydney. That is, the development of high resolution equipment which would be capable of producing pictures, that is isophotes, of an adequate sample of the radio sources in the sky, with a resolution which is sufficient to show the physical detail. I am rather attracted by a description of an optical analogy. The Hubble Memorial Atlas of Galaxies, which has been prepared by A. Sandage, does optically for galaxies just this: the numbers are sufficient to give a good sample (that, I think, means that if you double the number of galaxies you wouldn't have changed the statistics of the types of galaxies very much), and the resolution seems to be sufficient to show the physical detail. Now in the radio case, I don't think we need to have as high a resolution because I think that the objects that are physically significant are generally larger so this is some relief in the problem, but nevertheless the project is a very ambitious one. In my thinking it differs from the big Mills' Crosses in that it is an attempt to produce the equivalent of the 200-inch at Mt. Palomar, whereas the Mills' Crosses are more like the 40-inch Schmidt. My concept here is that radio astronomy requires both, one capable of giving full sky coverage, and the other capable of giving details on individual objects. Now I do not have cut-and-dried plans as to how this can be done, and I intend to approach it from the design studying. The first step in this design study should be to examine existing observations as carefully as possible to try to determine just what detail and sensitivity we really do require. This is where you come into it, because of the several series of observations which are highly relevant, your observations and Palmer's are the most significant, and in addition the Cal Tech observations are well worth while.

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Now what I should like to do would be to get you and Palmer together at Greenbank, and ask you to examine your respective observations jointly, with the objective of determining the statistics of the Fourier components of the discrete sources in the sky. Part of this, of course, exists in the number counts, such as those made by Mills and the Cambridge people. In this case the Mills statistics should refer to the zero frequency Fourier components, and the Cambridge observations to a restricted range of components. It is obvious that we should take this into consideration in addition to your and Palmer's observations. Now I remember that you do not wish to leave England permanently because of family considerations, but what I should like to suggest is that you come over to Greenbank for a period of something like four or five months with Palmer if I can arrange this, and that you work together on this. This is probably a part of the <sup>an</sup> ~~an~~ <sup>adj</sup> results of your observations which you have not actually followed up in detail. I presume that you have been working more on the physical significance of <sup>the</sup> observations. I'm looking at it here purely from the point of view of how to design instruments which can really give us ~~highly detailed~~ information. If you came to the States you would have the opportunity to visit ~~the~~ various radio astronomy centers in addition to Greenbank, and I think that you will find it a very worth while experience. I do not know whether it will conflict with your English commitments, assuming that you get the job at Cambridge, but I would suggest that it might well be compatible with them. The only snag I can see is that Martin Ryle might be on just the same track and wants to be secretive about it. However, if Martin Ryle is on this track, the information I am asking for is right up his street in any case. The only trouble would be if he has detailed schemes of how to achieve this, which he doesn't want to divulge at this stage. With regard to dates, I will be fairly flexible. I have been wondering about the possibility of fixing something towards the end of this year, but I have not been in contact with Palmer yet so I don't know his situation. It would be nice if it were possible to dove-tail your moves so that you would come together at Greenbank. I may say that it would be possible for you to do an analysis like this at a place other than Greenbank but I would very much like to have you visit Greenbank just so as to mix with the boys and stimulate the discussion generally on the sorts of topics in which you are interested. I'm not at this stage making any definite offer on matters of salary or details like this. I'm not able to do so because I have not been in sufficiently close contact with the AUI set-up since I have been in hospital since March 22. But what I would like to do would be to ask if you are interested, and if you are interested and can give me some idea of possible dates, then I can follow it up.

You might mention my potential release from hospital to Dr. Bowen and Lindsay McCready, and the rest of my friends in Radio Physics. I only heard today so this is the first news to reach Australia. I hope your work has been going well, and that you are getting really good physical results from the study of the observations.

Yours sincerely,

J. L. Pawsey

JP:jz P.S. Since dictating this Leona has written to Lindsay McCready telling him of my probable release from hospital. Her letter may have arrived before you receive this.

Please excuse a few irregularities in the composition of this letter which was dictated from a hospital bed.