

GEORGE C. SOUTHWORTH  
19 WILLIAMS ROAD  
CHATHAM, NEW JERSEY

September 2, 1960

Mr. Grote Reber  
National Radio Astronomy Observatory  
Green Bank, West Virginia

Dear Mr. Reber:

I have received your letter of August 29. It was good to hear from you and to learn that we may see you in the not too distant future. I was interested to hear from the attachment to your letter that you sometimes work with terrestrial things such as Haleakala lava flows occurring within the last few hundred years. I was interested to know too that isotope analysis can be used to fix recent dates. I was pleased to hear that work is progressing toward the reconstruction of Janskys early apparatus. I feel reasonably sure that the Laboratories will go along with you in this project.

As regards the specific questions that you have asked, your memory is better than mine about the "cross". I appear not to have filed a copy of my letter to you. Now I must be careful what I say! I do remember a great deal about the original idea. Though my notes are no longer at hand, it must have occurred about 1941. As I remember it, my cross consisted of two perpendicular Vees (Hansen horns) made up of leaky-pipe radiators each somewhat as shown in Fig. 10.2-5 of my book. They could however, have been like Fig. 10.2-3C. The four perpendicular arms were probably fed by a circular waveguide carrying a circularly-polarized dominant wave of a frequency of 3000 mc ( $\lambda = 10\text{cm}$ ). Since such a wave is equivalent to a plane-wave that rotates in space, the two "Vees" are energized alternately at the rate of  $3 \times 10^9$  times per second. At this point I am vague about how the results were to be displayed, but as cathode ray displays were very much in vogue at that time, they may be assumed. No apparatus was built and even my ideas are a bit fuzzy at this time.

I suggest th t you avoid mentioning me in connection with the "cross" I had my chance nearly twenty years ago and it is reasonable to assume that if I thought well of the idea, I would have developed it. I definitely do not want to appear to be trying to share in the glory of a device that is now firmly associated with the name Mills.

With kindest personal regards, I am,

Very Sincerely,

GCS:jlb

George Southworth

*George Southworth*

*P.S. We should like very much to have you call when you are next in this area and perhaps spend ~~an~~ night with us. Give us a ring to be sure we are home.*

*S.*