

October 11th, 1954
General Delivery
Wailuku, Maui, T.H.

Mr. Charles H. Schauer, Director
Division of Grants
Research Corporation
405 Lexington Avenue
New York 17, New York

Dear Hap:

It is about time to cast off here. Enclosed are some reprints. The main results of the studies here are:

1. The earth's atmosphere is bulged out along the equator in the form of a ring or thick disk about 40° wide.
2. Some of the celestial radio sources are multiple. The one in Cassiopeia is probably a cluster.
3. There are daily oscillations in the pressure of the earth's atmosphere with periods of 34 and 8 hours (but not 6 hours) in addition to the well known one with a period of 12 hours. All three oscillations exhibit characteristic annual variations of amplitude and phase.
4. The diurnal cycle of humidity atop the mountain is exactly opposite in phase to the humidity cycle at sea level.

Aside from item 2, these findings have little to do with the original purpose of coming to Hawaii. The meteorological data will probably be published in Pacific Science by the University of Hawaii. I am taking all of my cosmic static chart recordings with me and expect to analyse them in detail at Hobart. On the basis of this analysis, I will decide whether or not it is worthwhile making more observations at Kole Kole and if so, just what. Presently, I am rather weary. The existing results will ultimately be published in more detail.

My boxes and I will leave here on the 13th and Honolulu on the 17th. I will be staying at the Alexander Young Hotel at Honolulu and the Hotel Wentworth in Sydney.

Because the proposed measurements in Tasmania are so different from those being made here, nearly all new electronic apparatus had to be built or purchased. Due to long delays in procurement, I was unable to finish my apparatus and about six weeks work remain at Hobart. Some of the things were impossible to secure in America, so I bought them in England. They are being shipped direct from London to Hobart. I expect to setup as simply as possible to see

whether or not anything can be secured. If positive results are forthcoming, then more elaborate antenna systems may be erected. The general picture of what is possible in Tasmania should be available by July 1955 and I expect to leave there in August.

Now that the British have a large mirror, the idea of such a device emerges from the crackpot and attains respectability. When Mills was here he described to me the promotion at Cal. Tech. DuBridge wants to build a large mirror out of fibre glass because this material has a high ratio of strength to weight. This idea is a misconception because if enough material is provided and the structure properly proportioned to reduce the bending to a small value; then the structure will be overly strong. Actually the material should have a large ratio of modulus of elasticity to weight. Steel and aluminum are by far the best of the common materials.

Back in 1948 & 9, I designed a mirror with the characteristics on the attached sheet. Unfortunately the time was not right for its promotion. If you think you can sell it to someone, I'll be pleased to have you try. Berkner is a pretty effective kind of a fellow. Maybe he would like to undertake it. I believe that I showed to you the model once. It and the engineering to support it are now in the attic at 212 W. Seminary Ave., Wheaton, Illinois.

Enclosed is a financial statement. I'll write again as soon as I land in Sydney. Many thanks for all your assistance up to date.

Best regards,


Grote Reber

MIRROR DESIGN OF 1948 & 9

by Grote Reber

Mounting	Altian Smith
Structure	Similar to Wheaton mirror of 1937.
Diameter	320 feet
Focal Length	100 feet
Deformation due to bending	1/8 inch
Errors in construction	1/8 inch
Total roughness of surface	1/4 inch
Average roughness of surface	1/8 inch
Mirror material	aluminum plate
Rib material	aluminum I beam
Framework material	Steel Line Pipe
Weight of Mirror and Carriage	400 tons
Weight of turntable	250 tons
Total weight	650 tons
Cost of pipe and plate	\$85,000 approx.
Detail drawing and fabrication costs	Unknown
Estimated erection cost	\$1000/ ton
Cost of machine less drive	\$650,000

Detail drawings to be done by Goodyear Aircraft Co. at Akron, Ohio. Dr. Arnstein, chief engineer.

Fabrication and erection to be done by Hammond Tank Co. at Warren, Pa. Mr. Fred Plummer, chief engineer.

This design can probably be scaled up by a factor of two or even three with a commensurate increase in deformation.

It may be observed that this design is markedly better than the Manchester design which has a bending of 5 inches at center.

Grote Reber

Grote Reber 10-12-54

OPERATIONS IN HAWAII

At Kolo Kolo

Rent and Taxes	83.89	
Fuel and Maintenance	178.44	
Operator Hire	754.00	
		1016.33

Automobile (12,000 miles approx)

Taxes and Insurance	43.54	
Gasoline (832 gal.) and Oil	280.16	
Tires	94.46	
Repairs	115.30	
		533.46

Meteorological Data Analysis		454.00
Ionospheric Tabulations and Plots		190.00
Archeology explorations		105.80
Scientific Literature		88.75
Parts for Cosmic Static Motor		163.19
Trips Kauai & Honolulu 4/20 to 25	90.37	
Honolulu 7/12 to 17	43.54	
		133.91

Other

Bank Charges	6.06	
Postage and Insurance	36.06	
Photographic Supplies	30.57	
Writing Material	20.87	
		93.56

Total		\$2779.00
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ADVENTURE TO AUSTRALIA

Passport and Passage	306.17
Boxes for Apparatus, Freight & Insurance	165.00
Apparatus	
Brush Double Channel Oscillograph	697.00
Esterline Angus Drive	144.32
Special Coils	178.39
Grid Dip Meter	93.19
Small Parts and Tubes	220.52
Express and Duty on Imports	184.13
	1517.55
\$500.00 of Travellers Checks	503.75
Total	<u>\$2492.47</u>

SYNOPSIS OF FUNDS

Operations in Hawaii	2779.00
Adventure to Australia	2492.47
Total	<u>\$5271.47</u>
Check from Research Corporation 2/10/54	3570.00
Check from Research Corporation 8/24/54	1500.00
Cash advance by Grote Reber	301.47
Total	<u>\$5271.47</u>

Grote Reber

Grote Reber

October 10th, 1954