ONLINE 4 Lunar radar proposal of Martyn from 1930

QUOTE from Evans, W. F. (1973). "History of the Radio Research Board, 1926-1945." Commonwealth Scientific and Industrial Research Organization, Australia. page 280-281 The entire text is a quote from Evans.

QUOTE:

Radio Location: As early as 1930 Martyn, working with Laby's group in Melbourne, had urged the Board to initiate investigations in the field of ultra-short wave radio. In this year Martyn prepared a report entitled: "The reflection of wireless signals from the surface of the moon".¹ This report was not intended for publication, but nevertheless made interesting reading in the light of subsequent developments in radio and extra-terrestrial radar:

[Martyn]..... Considerable information regarding the possibilities of such developments would be obtained from a study of wireless signals reflected from the moon; and accordingly I [Martyn] have investigated the practicability of receiving such echoes. In attempting the experiment, the use of short-waves of only a few metres in length would be advisable. Such waves can now be readily produced at powers of the order of kilowatts. Owing to the shortness of the wave it is a relatively simple matter to construct a reflector to produce a concentration of energy or "beam" in the required direction It has been found experimentally that the waves travel in straight lines, and are entirely unaffected by the Heaviside layer, so that transmission and reception on the earth is confined to distances inside the horizon from the transmitter ...

continuing:

This development appears to the writer[Martyn] to provide a new tool to physics and astronomy. Thus a wireless beam may be used as a probe to investigate regions of the solar system, in much the same way that x-rays have been used. to examine the structure of matter. Observations on the time taken by the signal to return, the attenuation of the signal, its state of polarization, frequency, intensity and waveform,

¹ A decade later another RRB pioneer, Piddington (6 December 1940), continued to investigate the likelihood of lunar radar detection. An unpublished manuscript was prepared: "Analysis of Reflecting Properties of the Moon and Calculation of Power Necessary to Transmit Signals via Reflection at the Moon". (CSIRO Archive, August to 31 December 1940 Correspondence)

will all yield information regarding the size and shape of the object encountered, its constitution and its velocity relative to the earth The scientific value of experiments on these lines would be very great, On the 'practical side long distance communication from point to point on the earth would be feasible On very short wave lengths static and fading are entirely absent, but communication is only possible within visible range of the transmitter. By using very short waves reflected from the moon, it should be possible to overcome all these difficulties

It is hard to imagine a more precise and uncanny prediction, not only of radar, but also of the microwave link and the communications satellite. Martyn completed his report with:

...... [I]t is hoped that the Committee may see fit to sanction the erection of an ultrashort wave transmitter and reflector for the purpose,,,,,,,

It is interesting to speculate what might have happened had he been supported in this "crazy" [the term used by Evans] project. Martyn, however, became immersed in other aspects of radio transmission; and shortly he transferred from Melbourne to Sydney. The only direct result of his report was that the Board asked Cherry to prepare a literature survey of current research on ultra-short waves .

....Evans [continued his text with a discussion of the Cherry report on "Micro-Ray" (a new term invented by Cherry)]:

A copy of the Cherry summary has survived, but there is no evidence that the full report was ever completed. Shortly after this Cherry resigned from the Board to make a visit to overseas research centres. His survey covered a range of wavelengths from 10 metres down to 10 cm, which he designated as "microwaves". Some of Cherry's comments were interesting in the light of subsequent developments in radar:

[Cherry wrote] These very short wavelengths make the use of reflectors a simple proposition; and continuous metal mirrors as well as spaced wave aerials have been used effectively. Concentration of the beam to within a cone 10 to 15 degrees vertex angle is easily accomplished. Reflection from trees and other obstacles has been found, and even the presence of the observer completely alters the disposition of the electric and magnetic fields at the receiving site. The shortest limit for practical communication for broadcasting has been suggested as being about 3 metres. Regular tests have been carried out in Berlin on wave lengths 6 to 8 metres, and satisfactory reception up to 10

to 15 miles has been found, depending on the height of the oscillator and the type of terrain passed over. The power in the aerial has been about 250 watts, but it has recently been increased to several kilowatts. No details of the improvement are available. [no reference was provided]

Green of the Radio Research Board also provided an additional report with the title "Ultra-Short Waves" which described a possible one metre system to enable communication between ships at sea.

END QUOTE