Kuiper, Gerard P. and Miczaika, G. R. *A new observatory in Chile.*

The establishment of a new observatory in the vicinity of Santiago de Chile has become possible as a result of concurrent interests by the Universities of Chile, Chicago and Texas; and the Geophysics Research Directorate of the Air Force Cambridge Research Center. An agreement between the three Universities has been signed which covers the construction of the Observatory building and access road by the University of Chile; the initial staffing and operation of the Observatory by the Universities of Chicago and Texas, in close coordination with the McDonald Observatory; and a student- and faculty-exchange program between the Universities of Chile and Chicago. A contract between the Air Force Cambridge Research Center and the University of Chicago covers the erection of a 60-inch reflector at the Chile observatory. The primary mirror will have an aperture ratio of $f/5$, but no arrangements will be made for use of the prime focus; this avoids the necessity of using a bridge and a fairly large dome. Instead, two Cassegrain foci will be used, one $f/8$ for photography and one $f/13.5$ for photoelectric and spectrographic work. A preliminary site survey was made in March 1959, and systematic site tests were begun in May to permit a final decision between three or four sites selected. The design of the telescope is well under way; completion of the installation is expected in December, 1961.

*Yerkes and McDonald Observatories
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Geophysics Research Directorate
Air Force Cambridge Research Center
Bedford, Mass.*

Lichtenstein, Pearl R. *Calculation of cosmic radio noise absorption produced by pulses of ionizing radiation.*

The time variation of excess electron density in the D-layer of the ionosphere, which results from pulses of ionizing radiation associated with solar flares, has been calculated. It is assumed that the change in electron density due to the pulse is small compared with the undisturbed value, a condition which is true only for very small events. At low frequencies, such as 18 Mc/s, the absorption is shown to be directly proportional to the excess electron density.

Comparison of calculated absorption curves with sudden cosmic noise absorptions observed at Rensselaer shows: 1) the peak absorption is delayed with respect to the peak of the ionizing pulse; and 2) the value of the recombination coefficient is of order 3×10^{-6} cm³/sec, a higher value than is obtained from other types of measurements.

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Lilley, Edward and Brouwer, Dirk. *The solar parallax and the hydrogen line.*

The use of absorption lines in the spectra of discrete sources as frequency standards is examined. Such lines appear to be particularly attractive for a measurement of the solar parallax. Produced by the hyperfine transition $F = 0 \rightarrow F = 1$, the absorption lines are the sharpest features known in 21 cm research.

An interstellar $H\text{I}$ cloud which produces the absorption line, has some velocity with respect to the sun. By measuring the exact frequency of the line on two occasions about six months apart, one can eliminate the cloud's constant motion and obtain a value of the earth's orbital velocity. The velocity measurements permit one to compute the solar parallax. This is a standard method with stellar radial velocities which, because of optical limitations, has not been successful in improving knowledge of the solar parallax. However, by shifting the experiment into the radio domain, sufficiently precise Doppler measurements are possible.

A number of calculations have been performed to investigate the accuracy of the hydrogen line-solar parallax experiment. We find that it is a "time-limited" problem, and that two basic quantities compete to limit the precision of a single measurement. The quantities are:

- (1) The natural rate, $d(\Delta\nu)/dt$, at which the absorption line shifts frequency due to the orbital and rotational motions of the earth.
- (2) The minimum time, τ , during which a given radio telescope and receiver combination, working on a particular source, can achieve a measurement accuracy of δf cycles.

The expressions for (1) and (2) are:

$$\frac{d(\Delta\nu)}{dt} = \frac{v_0 k}{c} \cos \delta \cos \phi \cos H \frac{dH}{dt} \quad (1)$$