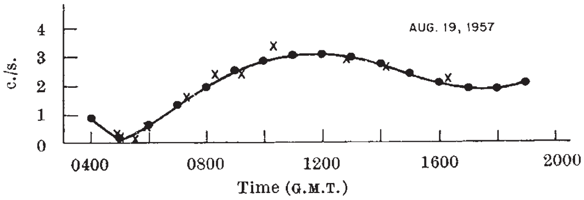

Fig. 3. Fading-rate of signal reflected from the Moon. ●, Computed; ×, experimental

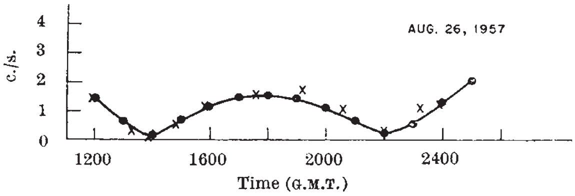

Fig. 4. Fading-rate of signal reflected from the Moon. ●, Computed; ×, experimental

It appears that the limiting factor in the accuracy of the computation is probably the somewhat abbreviated values of selenographic latitude and longitude, published in the American Ephemeris and Nautical Almanac. However, apart from the periods of very low fading-rate, excellent agreement was obtained between measured and computed values. Hence, for frequencies in the ultra high-frequency band, it appears that the rapid fading of a signal reflected from the Moon can be predicted in some detail from dynamical considerations. Thus other effects, for example, those which might be due to the ionosphere, must be correspondingly limited. Any extreme effect, such as that which might occur during auroral activity, might show up experimentally as a noticeable departure from the computed values.

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S. J. Fricker
R. P. Ingalls
W. C. Mason
M. L. Stone

Lincoln Laboratory,
Massachusetts Institute of Technology.
Aug. 21.

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Possible Causes of Geomagnetic Fluctuations having a Six-Second Period

Geomagnetic fluctuations of two different types in the frequency-range 0·1–30 c./s. have recently been reported by Duffus *et al.*[1]. Fig. 2 of their communication shows that one of these types closely resembles two other naturally occurring oscillations, and has a period (about 6 sec.) of the same order as the latter. These two naturally occurring (and probably associated) oscillations are microseisms and microbaroms, and one or the other of them may be the cause of the observed magnetic oscillations.

If the pick-up loop used for recording the variations of the magnetic field was so mounted that the microseismic oscillations of the Earth's crust could have caused rotation of the loop with respect to the Earth's permanent magnetic field, it is possible that currents having the same frequency as the microseisms could have been induced in the loop. Because of the very large wave-lengths of the seismic oscillations, however, this explanation seems somewhat improbable. (The entire loop would tend to move up and down as a unit rather than rotate.)

It seems somewhat more probable that the observed magnetic effects result from atmospheric oscillations of the same period. These oscillations were first observed by Benioff and Gutenberg[2,3], and were named by them microbaroms. Microbaroms have also been studied by other workers[4–7]. It has been pointed out by Daniels[6] that the particle amplitude of microbaroms would be much greater at ionospheric levels than at the Earth's surface, the amplification being of the order of 1,800 at an altitude of 120 km. Particle velocities of the order of 40 cm. $sec.^{-1}$ would therefore occur at this altitude if the pressure amplitude at the Earth's surface were 1 dyne $cm.^{-2}$ (a value which is occasionally observed).

A detailed theory explaining how an atmospheric oscillation having such a period and velocity can give rise to a magnetic fluctuation still remains to be formulated. The relationship between the magnetic and microbarometric oscillations could, however, be studied experimentally by making simultaneous observations of the two phenomena. A similar study was made by Saxer[7] for the purpose of establishing a correlation between microbaroms, microseisms and ocean waves. One difficulty connected with such a study is that the microbarometric pressure variations are so small that they are often masked by pressure fluctuations due to atmospheric turbulence. This interference, however, could be minimized by using an infra-sonic line microphone of the type invented by Daniels[8] with which an improvement in the signal-to-wind-noise ratio of as much as 20 db. can be achieved at frequencies in the region of interest.

Fred B. Daniels

U.S. Army Signal Research and Development Laboratory,
Fort Monmouth,
New Jersey.

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Zeta Potential and Sedimentation Behaviour in Flocculated Cane Sugar Juice

The stability of an aqueous suspension is reflected in both sedimentation-rate and sedimentation-volume[1,2]. In a stable system, settling of the single particles is slow, but they remain free to move independently of each other into positions of close