

be about $\nu = h(4\pi\rho)^{-1/2}$. We have an approximate condition

$$N \cdot \frac{\rho_i}{\rho} \nu_i \approx \rho \nu \text{ and } N \approx \frac{\nu \rho}{\nu_i \rho_i} \approx \left(\frac{\rho}{\rho_i} \right)^{1/2}$$

The wave period must exceed $4Nt_n \approx 4 \left(\frac{\rho}{\rho_i} \right)^{1/2} t_n$ in order that the atmosphere would be able to take part in the magneto-hydrodynamic oscillations. If this condition is not fulfilled only the magneto-ionic waves will exist. The velocity of their propagation is about $\nu = H(4\pi\rho_i)^{1/2}$ and the damping of these waves is very large according to Dr. J. Piddington's investigations. Calculations show that this condition is not fulfilled in the normal E , F_1 and F_2 layers.

Crimea, USSR, December 28, 1956.

I am, Gentlemen,

Yours faithfully

S. B. PICKELNER

Crimean Astrophysical Observatory.

Dear Sir,

In a recent paper (*Tellus*, 1956, 8, No. 2, p. 241) an attempt has been made to explain the giant pulsations in the auroral zones in terms of hydromagnetic waves. Prof. S. B. Pickelner has pointed out in the preceding note that the coupling between the ions and the neutral gas is too poor for the total mass of gas to oscillate as a whole. I fully agree that, with the present knowledge of ionospheric data, such a type of oscillations is impossible outside the auroral zones. What speaks in favour of such oscillations inside the auroral zones is that the periods of oscillation of ordinary hydromagnetic waves can be made consistent with the observed periods of giant pulsations (between 60 and 300 seconds). In order not to conflict with the difficulties pointed out by Pickelner the ionization degree has to be high inside the region of a giant pulsation. Consequently, reliable data have to be obtained for the ionization degree inside such a region before it can be decided whether a hydromagnetic approach is relevant or not.

Stockholm, Sweden, January 7, 1957.

BO LEHNERT

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Errata

Volume 8, number 4. Page 434, 2nd column, line 7 from below: For "alone on giant hygroscopic nuclei" read "in the life of one cumulus bubble".