Seeing that they are largely influenced by environmental factors, the *absolute* values of such initial flame speeds in moist $CO - O_2$ media are of no fundamental import, the real question being where, under given conditions, the maximum speed-point lies on the speed-composition curve. In view of the considerable CO_2-dissociation in CO-oxygen flames, the maximum speed is to be expected with an excess of carbonic oxide. Anyone studying our recent results will (I think) agree with our conclusion that, *provided all due precautions are taken to ensure accuracy in the measurements*, "with moist media, saturated at 15° . . . [it] is attained at the $3CO + O_2$ composition".

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Chladni Plates at High Frequencies

IN order to make a high-frequency oscillator for brass plates, I wound a suitable inductance around a nickel rod twelve inches long and one eighth of an inch in diameter. The inductance was excited at 15,000 vibrations per second from an audio vacuum

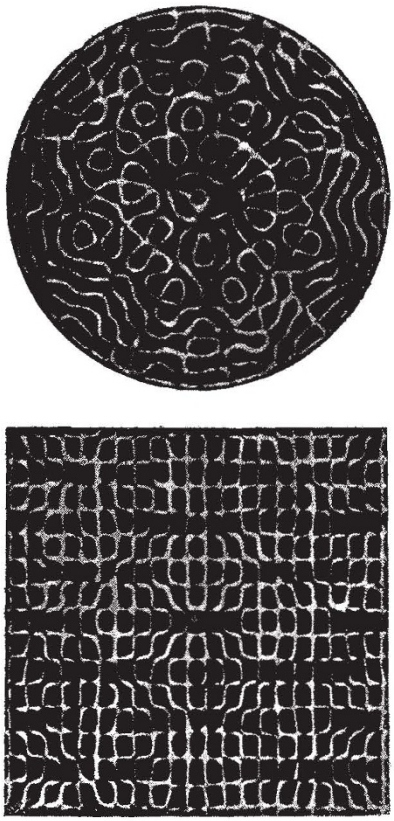

FIG. 1.

tube circuit connected through a power amplifier. The nickel rod was in a vertical position and the square Chladni plates were balanced upon it. The figures shown in the photographic reproductions (Fig. 1) were formed in this way.

When a circular plate was balanced on the rod, only circular nodal lines were formed. I therefore clamped the circular plate at the centre and pressed the oscillating nickel rod against the under side of the plate near the edge.

Calculation shows that the plates oscillate at a submultiple of the oscillation in the rod. They cannot take up such a high vibration as 15,000 per second.

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Influence of Light on Paramagnetic Susceptibility

SELWOOD[1] has recently published the result of his investigation on the influence of the absorption of light on the paramagnetic susceptibility of certain solutions, in which he fails to confirm our observation of the increase of susceptibility under such conditions. He finds, in agreement with Gorter's observation, that there is a gradual diminution of susceptibility of the solution which can be attributed to a rise of its temperature, due to absorption of light. The method used by him is that due to Decker, in which a test piece of glass of nearly the same susceptibility as the paramagnetic solution is suspended from a torsion head between the pole pieces of an electromagnet. The sensitiveness of his apparatus is claimed to be 0·005 per cent.

It appears to us that besides the sensitiveness of the apparatus used in measuring the change in susceptibility, there is another factor involved, namely, the magnitude of the change ΔK produced by absorption of light. If n_2 is the number of ions per c.c. in the excited state and p_1 and p_2 are the magnetic moments of the ion in the ground and excited states respectively, then

$$\Delta K = \frac{2p_1}{3kT} n_2 (p_2 - p_1);$$

and n_2 will be proportional to the amount of light energy absorbed. In the modified 0-tube method used by us in our recent experiments, an account of which has been sent to the *Philosophical Magazine* for publication, we used a solution of $CrCl_3$ containing 0·078 gm. of Cr+++ per c.c. with $K = 13{\cdot}42 \times 10^{-6}$; the horizontal portion of the 0-tube is a capillary tube of bore 1·8 mm., which was filled partly with the solution, and the meniscus placed between the poles of an electromagnet of field strength of about 40,000 gauss, and the light from a mercury arc was focused on it. About 81 per cent of the light was absorbed in the solution and the change of susceptibility produced was equivalent to an increase of volume susceptibility of air due to an increase in pressure corresponding to a 2·4 cm. column of water; that is, $\Delta K = 7 \times 10^{-11}$ c.g.s. units. The rise of temperature of the solution was about 0·001° C. per sec.

From our experience, it appears that in Selwood's experiment the amount of light energy absorbed by the solution at the boundary of the test piece, where the magnitude of the change ΔK alone is of importance, was too feeble to produce any measurable deflection with apparatus of the sensitiveness of that used. In the course of our investigation, we have employed a similar type of apparatus to that described by Selwood, but we enclosed the paramagnetic solution in the glass test piece and the outer solution was of colourless $CeCl_3$; with this arrangement we obtained negative results.