A Low Frequency Oscillator.

IT may be of interest to readers of NATURE who are working with low frequency to know of a new form of oscillator.

At present I am using a low frequency oscillator which gives excellent results with a delicate adjustment of the frequency to a given value. The circuit used is that in which the oscillations are produced by coupling the grid and plate circuits of a thermionic

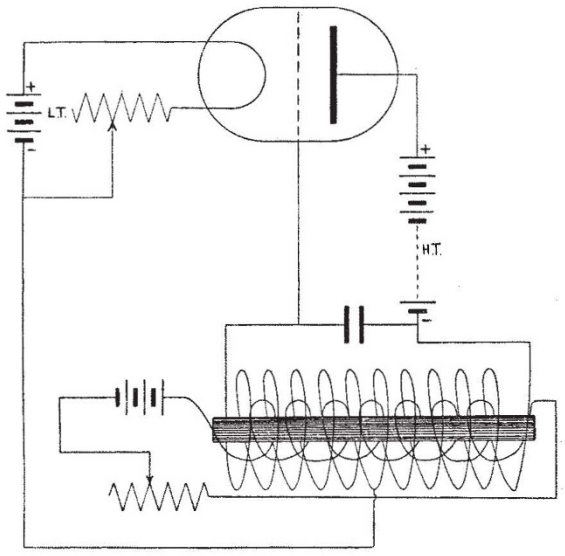

FIG. 1.

valve by mutual inductance and capacity. In the ordinary circuit the frequency is changed by sliding an iron core. In the circuit now described the inductance is altered by passing a D.C. current round an iron core. The pitch of the note for a given capacity changes as the exciting current changes. There are many advantages of this oscillator, one of which is the maintenance of symmetry for the different inductances. A full description with test details is now in course of preparation for publication. The diagram (Fig. 1) gives an idea of the oscillator circuit and how it works. C. CONSTANÇON.

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Doublet Separation in C II and Si IV.

FURTHER work has been done on the ultraviolet spectrum of carbon and silicon using a diffraction grating having a radius of 192·1 cm. The resultant dispersion of about 9 Å.U. per mm. has enabled us to obtain the following spectral lines in Fowler's [1] series for C^+ as doublets and to measure the separation as shown in the following table :

Line. Bohr's Notation.	$\Delta\nu$ observed.		$\Delta\nu$ as calculated by Fowler.[1]
	2nd order.	3rd order.	
$2\pi_1-3\sigma$, $2\pi_2-3\sigma$ $\lambda=858$ Å.U.	64	60	58
$2\pi_1-3\delta$, $2\pi_2-3\delta$ $\lambda=687$ Å.U.	64·5	..	58

The separation of the components of the line at 858 Å.U. was measured in the second order on nine plates and in the third order on three plates, using a comparator reading to 0·001 mm. and taking the average obtained from ten settings on each component. The measurements on 687 Å.U. were made in the second order only and on two plates.

The third member of the first sharp series was not recorded by Fowler, but was found by one of us [2] as an unresolved line at 577·4 Å.U.

We have also measured the separation of the doublets at 1335 and 1036 Å.U., and the results from seven different plates, using the second order, give $\Delta\nu = 65$ for the 1335 doublet and $\Delta\nu = 62$ for 1036. The focussing in the case of the latter was not so sharp as for 1335, but the results seem to indicate that the two separations are the same and that 1335 therefore belongs to C^+ as Millikan [3] has already stated.

In the series of Si IV as recorded by Fowler,[4] we have resolved the doublet $3\sigma_1 - 4\pi$, $3\sigma_2 - 4\pi$ in the second order and find the separation $\Delta\nu = 153$.

The following lines in these series not previously recorded have also been found : $4\sigma - 6\pi$ in first order only and unresolved ; and the single line $4\delta - 7\phi$.

Experimental details will shortly be published.

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The Attraction between Homologous Chromosomes.

IT has been shown that the chromosomes of Datura (*American Naturalist*, vol. 56, pp. 339–346, 1922), Hyacinthus (*Genetics*, vol. 10, pp. 59–71, 1925) and Uvularia (*Journal of Genetics*, in press), for example, are combined side by side, and end to end, at the reduction division. If n is the haploid number of chromosomes, this finding of partners and conjugation of chromosomes points to the presence of $2n$ different attractions. (It is easily demonstrated in Uvularia that homologous ends of each chromosome are opposed, for the ends of the chromosomes differ in appearance.) This is confirmed by the formation of trivalents, quadrivalents, quinquevalents, etc., in triploid, tetraploid,

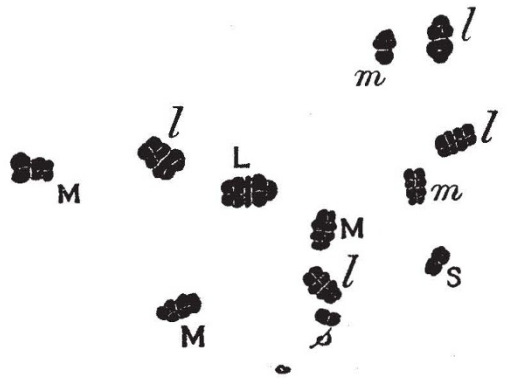

FIG. 1.—Datura chromosomes.

and other plants with more than two homologous chromosomes ; and also by the fact that none of the 12 chromosomes of the haploid Datura pair at the reduction division (Fig. 1). Such a number of attracting forces seems perhaps unexampled in physics. JOHN BELLING.

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[1] Proc. Roy. Soc., March 1924.
[2] Trans. Roy. Soc., A, 224, 371-419.
[3] *Phy. Rev.*, September 1924.
[4] Proc. Roy. Soc., June 1923.