

Isolate with which the <i>C. betacea</i> and <i>Carica papaya</i> <i>Phytophthorus</i> were grown in paired cultures	Plus strain					Minus strain			
	<i>Areca</i> , S. Kanara	<i>Areca</i> , Bombay	<i>Colocasia</i> , S. Kanara	<i>Tomato</i> , Coimbatore	<i>C. betacea</i> Burliar	<i>Ca. papaya</i> Coimbatore	<i>H. eesul</i> entus, Coimbatore	<i>Spondias</i> S. Kanara	<i>Areca</i> , Bombay
<i>Cyphomandra betacea</i> isolate	0	0	0	0	0	X	X	X	X
<i>Carica papaya</i> isolate	X	X	X	X	X	0	0	0	0

X — Cospores formed within four days; 0 — no oospores formed.

coligist's stock culture collection at Coimbatore. The results of these trials are set down below in a tabular form:

These results show that the *C. betacea* isolate is a plus strain of *P. palmivora* and the other a minus strain.

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### ON THE ANALYSIS OF BLOOD-GROUP DATA OF PUNJABIES AND MALDIVIANS

KALRA<sup>1</sup> has examined the blood groups of 2,500 Punjabies at I.M.H., Rawalpindi, and of 211 Maldivians at Adder Atoll. This note gives the results of statistical analysis of the data collected by him.

Let *p*, *q* and *r* represent the true gene probabilities of the three allelomorphic genes A, B and O respectively, so that *p* + *q* + *r* = 1. These true values for Punjabies and Maldivians are,

the blood-group data are in good agreement with Bernstein's genetical theory.

The maximum likelihood estimates of gene probabilities for Punjabies and Maldivians, along with their standard errors, are presented in the annexed table.

Column 3 of this table gives the estimated gene probabilities, Column 4 the corresponding variances and Column 5 the estimated gene probabilities and their standard errors, both multiplied by 100. It would appear from this table that the proportions of A and B genes in the case of Punjabies are significantly higher than in the case of Maldivians. However, the proportion of O genes for Punjabies is significantly lower than that for Maldivians.

Dept. of Agriculture, U.P., Lucknow, April 25, 1947.

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1. Kalra, S. L., *Curr. Sci.*, 1947, 16, 92.
2. Stevens, W. L., *Ann. Eugenics*, 1938, 8, 362.
3. Bernstein, F., *Klin Wschr.*, 1924, 3, 1495.
4. —, *Z. indukt. Abstamm. -u. Vererblehre*, 1925, 37, 237.

Caste	Gene	Estimated Probability	Variance	Percentage and standard error
1	2	3	4	5
Punjabies	O	.5942048	×10 <sup>-5</sup> 5.6601849	59.420 ± 0.752%
	A	.1752423	3.1879764	17.524 ± 0.565%
	B	.2305529	4.0625955	23.055 ± 0.637%
Maldivians	O	.7653750	×10 <sup>-4</sup> 4.58493	76.538 ± 2.141%
	A	.1051228	2.35896	10.512 ± 1.536%
	B	.1295022	2.86833	12.950 ± 1.694%

however, unknown, and have, therefore, to be estimated from the samples examined by Kalra. The most efficient estimates of the true gene probabilities are readily obtained by the use of the method of maximum likelihood which has been discussed in full detail by Stevens.<sup>2</sup>

Using the maximum likelihood estimates of the true gene probabilities, the conformity of the blood-group data for Punjabies and Maldivians with the genetical theory advanced by Bernstein<sup>3,4</sup> has been tested by applying the  $\chi^2$ -test with one degree of freedom. For Punjabies,  $\chi^2 = 2.25782$  ( $0.20 > P > .10$ ) and for Maldivians,  $\chi^2 = 0.10361$  ( $.90 > P > .80$ ). Neither of these values is, therefore, significant at the customary 5 per cent. level of probability. Thus, for both Punjabies as well as Maldivians,

### EFFECT OF CERTAIN FACTORS ON THE PULSE FREQUENCY OF A RELAXATION OSCILLATOR

AN audio-pulse frequency oscillator working on the relaxation oscillations of a thermionic valve controlled by the constant 'CR' of the time circuit has manifold applications. The device is usually a condenser shunted by a high resistance suitably placed in the oscillator valve circuit. A number of arrangements have been described by many authors,\* but none seem to have paid much attention to the effect of other factors on the pulse frequency apart from the constant 'CR'. The object of the present communication is to give the effect of

two factors (a) the inclusion of a small inductance in the time circuit and (b) the filament current, on the pulse frequency.

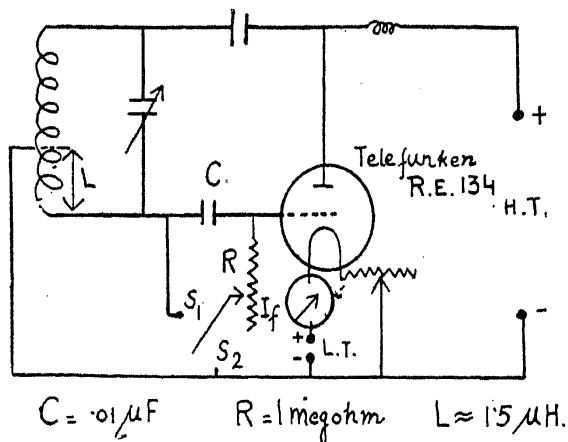


FIG. 1

The oscillator used for the investigation was a parallel fed Hartley Type one, suitable for short-wave range of 50 to 150 metres, the pulse generating device being a fixed condenser C of .01 M.F. capacity shunted by a variable carbon resistance having maximum value of one megohm. The switch in position  $S_1$  shunts the condenser C by R directly, whereas in position  $S_2$ , through small inductance L. Loosely coupled crystal wave-meter serves for the detection of pulses. The audio-frequency of the note was determined with the help of standard tuning forks and a sonometer. Throughout the investigation the carrier wave-length was maintained at a fixed value. Variation of pulse frequency 'f' with resistance R was studied for two different filament currents and the two positions  $S_1$  and  $S_2$  of the switch. However, the filament current cannot be changed much from the rated value without affecting the performance of the valve. Results are graphically shown in Fig. 2. The points marked as  $\odot$  correspond to the position  $S_1$ , and that as  $+$  to the position  $S_2$  of the switch.

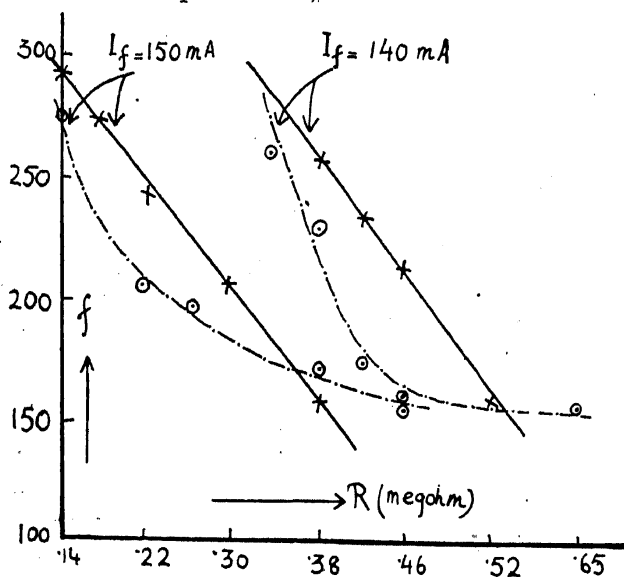


FIG. 2

It is seen from the graphs that if the usual method of directly shunting the condenser is used then the variation of pulse frequency 'f' with resistance R is non-linear. The effect of

inclusion of a small inductance in the time circuit is to make the variation linear.

The reduction of filament current has no effect on the range of pulse frequency which is 160 to 300 cycles in the present case; but higher values of resistance R are necessary to get the same range.

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March 8, 1947.

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\* 1. Appleton, Watt and Herd, *Proc. Roy. Soc.*, 1926, 111, 673. 2. Schafor and Gordall, *Proc. Inst. Rad. Eng.*, 1932, 20, 1131. 3. Morgen, *Rev. Sci. Inst.*, 1938, 9, 180. 4. Morin, *Compt. Rend.*, 1938, 205, 1580.

### PARTITIONS OF AIR MASSES IN THE TROPICS, AND THE I.T.F.

THE Norwegian school of meteorologists expounded and developed the Polar-Front theory of extra-tropical cyclones. An active outbreak of cold polar air across this semi-permanent polar front led to the formation of the cyclones. The approximate positions of the semi-permanent Polar, Arctic and Antarctic fronts were given. An equally simple picture for a semi-permanent front given by the same school is the Inter-tropical-front (I.T.F.) representing the belt or region of convergence of the trade-winds from the two hemispheres. This line was represented as a broken line circling round the globe.<sup>1</sup> Willett has made the line a bit more continuous or unbroken.<sup>2</sup> It is very nearly the pressure equator. In Indian area, Willett has passed the line in summer through the seasonal low pressure area. But in the corresponding North American area, the line is kept away from the seasonal low, and drawn nearer the geographical equator. The behaviour of "Hurricanes" of West Indies must have been responsible for this change.

In India, the importance of this partition of the trade-winds from the two hemispheres has been implicit in Eliot. In describing the passage of Typhoons of the China Seas into the Indian area, the position of this partition has been found very useful by Doraiswamy Iyer<sup>3</sup> who has described its position from month to month.

The weather in the tropics needs three air masses—Equatorial Maritime air (Em.), Far-Eastern Transitional or Mixed air (Tr.) and Tropical Continental (Tc.) or Tropical Continental-Martime air (Tcm.). In several papers, these air masses have been described and their properties developed.<sup>4</sup>

During the northern summer Em. has a southerly component; the Tr. may have components from both north and south according to the geographical position and the Tc. is from W. or W.N.W. All these three air masses are essential, and without any one of them a monsoon depression, a tropical cyclonic storm or a tropical depression cannot form in the strict sense.<sup>5</sup>

The main criterion of drawing the I.T.F. is the direction of the wind. It separates at some places Em. and Tr. and at others Em. and Tc. or Tcm. The partition between Em., which