

where \mathcal{M} is the whole map-distance between the two intervals, \mathcal{M}_r is the map-distance on the right segment from the boundary; $a = 0.257 = a_e$, $b = 0.559$ (Fig. 2). The limits of the validity of this equation can be discussed only when suitable experimental data are available.

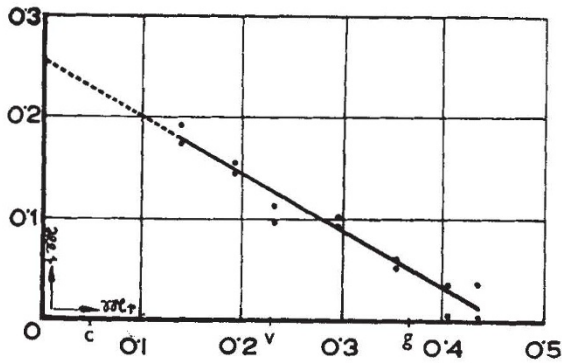


Fig. 2.

TRANSITIVE INTERFERENCE. ABSCISSA: PRIMARY MAP OF THE RIGHT SEGMENT; 0 POINT=MIDDLE OF THE INTERVAL CV C.

The three constants a_e , a_r , b make it possible to compute from six f -values between neighbour genes, which stand for the six observed f -values—that is, from the loci of the seven genes on the primary map—all 21 f -values, the average deviation being 0.6 per cent with a maximum of 1.8 per cent (Table 1).

TABLE 1. f -VALUES OF THE "XPLE" EXPERIMENT.

		sc							
ec	Calc.	0.068							
	Obs.	0.068							
cv	Calc.	0.164	0.096						
	Obs.	0.163	0.096						
c	Calc.	0.247	0.179	0.083					
	Obs.	0.245	0.180	0.084					
v	Calc.	0.371	0.314	0.227	0.147				
	Obs.	0.370	0.314	0.228	0.147				
g	Calc.	0.428	0.385	0.317	0.251	0.112			
	Obs.	0.430	0.387	0.319	0.279	0.110			
f	Calc.	0.466	0.436	0.389	0.337	0.221	0.112		
	Obs.	0.465	0.435	0.389	0.334	0.219	0.114		

The left segment was calculated on the basis of the simplifying assumption $i = 1$. Using Morgan's terminology, the two equations represent the relation between frequency of crossing-over and frequency of recombination⁷.

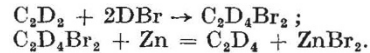
K. DE KÖRSÖY.

Institute of Physiology,
University of Budapest.
July 1.

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⁶ Stern, C., "Handb. der Vererbungswiss.," **1**, H. 125 (Berlin, 1933)
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Raman Spectra of Deuteroethylenes

THE various deuteroethylenes can be obtained by exchange from ethylenes and deuterium oxide on a nickel catalyst. 15 gm. of heavy water (D₂O) and 6 litres of ethylenes (N.T.P.) yielded after an exchange of several days at 150° C. a mixture of ethylenes containing about 50 per cent of the hydrogen as deuterium. The Raman spectrum of this substance was taken. In order to identify the lines and attribute them unambiguously to the different compounds, some of the deuteroethylenes have been prepared in a pure state. The ethylene C₂D₄ was obtained in the following way :



The compound so obtained contained about 10 per cent C₂D₃H; its D content was thus about 97 per cent of the total hydrogen. The *cis* and *trans* di-deuteroethylenes were obtained in an analogous way starting from C₂D₂ and HBr. The comparison of the various spectra permits the classification of the lines as shown in the accompanying table :

C ₂ H ₄	C ₂ D ₄	C ₂ H ₂ D ₂	C ₂ HD ₂	C ₂ H ₂ D ₂ <i>cis</i> and <i>trans</i>	C ₂ H ₂ D ₂ <i>asym.</i>
1621	1515	1600	1545	1567	1581
3007	2251	3016	2272	2276	2221
1341	981	1397	996	2290	
3082	2304	3104		1282	1379
		1285		1214	
		2266	2215	3033	
		2965		3046	
				763	
				863	

(cm.⁻¹).

There is a slight discrepancy between the experimental results and the theoretical calculations carried out by Manneback and Verleisen. The potential function proposed by these authors has thus to be revised; this revision has been started by Manneback and his co-workers. The comparison of the first three lines (*S*₁ lines) of C₂H₄ and C₂D₄ gives a measure of the anharmonicity correction. The ratio of the product of these three frequencies should be 2. Deviations from this value are to be ascribed to the anharmonicity of the vibration. This constant was not taken into account in the earlier calculations; in fact, we find the value :

$$\frac{1621 \times 3007 \times 1341}{1515 \times 2251 \times 981} = 1.954.$$

The results indicate that it is of the order of magnitude of 2 per cent. Several lines not given in the table could be detected in the spectrum of the di-deuteroethylenes. It has not been possible to ascribe them unambiguously. Further work is in progress.

M. DE HEMPTINNE.
J. JUNGERS.
J. DELFOSSE.

Physical Laboratory,
University,
Louvain.
July 13.