Die aus 8 solchen Versuchen errechneten Mittelwerte und Streuungen sind in den beiden mittleren Kurven der Figur 2 dargestellt. Bei höherer Barbituratkonzentration fehlte unter gleichen Reizbedingungen die primäre Amplitudenzunahme der b-Welle, während sie bei der a-Welle noch nachweisbar war (Figur 2, obere Kurven). Niedrigere Konzentrationen bewirkten dagegen eine anhaltende Vergrösserung beider Wellen (Figur 2, untere Kurven). Hinsichtlich der Restitution ist zu berücksichtigen, dass die Amplitude des ERG auch im Leerversuch (längerdauernde Umströmung mit barbituratfreier Tyrodelösung) etwas abnehmen kann. Evipan produzierte entsprechend seiner geringeren pharmakologischen Wirksamkeit[5] nur in einem schmalen Konzentrationsbereich eine Amplitudenzunahme von a- und b-Welle.

Werden Lichtreize von 1 sec Dauer dargeboten, so lässt sich das Verhalten des off-Effektes (d-Welle) verfolgen. Wie Figur 1b zeigt, ging die primäre Zunahme von a- und b-Welle unter Pentothal-Na mit einer gleichzeitigen Abnahme des off-Effekts einher; dabei verschwand zuerst die langsame Komponente des off-Effekts, später verkleinerte sich die schnelle off-Komponente und schliesslich auch die a- und b-Welle. Während anschliessender Umströmung mit barbituratfreier Lösung kam es zu einem langsamen Wiederanstieg, der bei b-Welle und off-Effekt zu deutlich erhöhten Werten führte. Eine sekundäre Zunahme wurde auch mit Evipan bzw. Hexobarbital-Na erhalten. Dabei liess sich zeigen, dass die sekundäre Potentialvergrösserung nach einer 20 min dauernden Einwirkung von $5 \cdot 10^{-4} M/l$ Hexobarbital-Na nicht auftrat, wohl aber nach einer Einwirkungsdauer von 40 bzw. 60 min.

Der nunmehr auch beim Kaltblüter nachgewiesene Barbiturateffekt ist retinaler Natur und darf daher nicht als Argument für eine funktionelle Bedeutung efferenter Opticusfasern[6] gewertet werden. Besonders hervorzuheben ist die Tatsache, dass durch Barbiturate in Abhängigkeit von Konzentration und Einwirkungsdauer eine Vergrösserung oder eine Verkleinerung der ERG-Amplitude verursacht werden kann. a-, b- und d-Wellen können dabei ein gegensätzliches Verhalten zeigen und unterschiedliche Empfindlichkeit aufweisen.

Summary. The influence of barbiturates on the electroretinogram was studied in the isolated perfused retina of the frog; a-, b-, and d-waves were altered differently. The effect (increase or decrease in amplitude) depended on the concentration as well as on the duration of application.

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The Genotypic Control of the Duration of Copulation in *Drosophila melanogaster*

The experimental techniques and analytical methods of biometrical genetics have been recently applied to behavioural traits in *Drosophila*[1] and other organisms[2]. Thus in *D. melanogaster* and *D. persimilis*, mating speed has been shown to be under genetic control[1,3,4], and in *D. pseudoobscura* both mating speed and duration of copulation have been shown to be under genetic control[5,6]. In this paper, therefore, experiments designed to see to what extent the duration of copulation is heritable in *D. melanogaster* will be reported.

The experiments were based on inbred lines all with an Oregon background which had been maintained by over 120 generations of sibmating. Some of the lines have been used previously in mating speed experiments[1]. Flies were separated at eclosion and then stored singly for 4 days in vials. They were then shaken together in single pairs and the mating speed and duration of copulation recorded. Any pairs not mating within 60 min were recorded as unmated.

In the first experiment 5 lines were tested at two successive generations. The lowest number of successful matings for any line in a given generation was 26, so that all other sets of results were reduced to this figure using random number tables[7]. This permits a simple analysis of variance to be carried out.

Table I (a) shows the mean durations of copulation in min for each line for each generation with means combining the generations. An analysis of variance revealed a significant lines effect ($< 0.1\%$) but insignificant effects due to generations and for the generations $\times$ lines interaction, thus these two components were lumped with the error as presented in the analysis of variance in Table I (b). From this analysis, by equating observed mean squares with expected mean squares, values of the genotypic variance σ_G^2 and the environmental variance of σ_E^2 can be computed[8], and hence the heritability of the duration of copulation in the broad sense, σ_G^2/σ_E^2 which came to 0.179.

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A further experiment on four inbred lines, namely N1, N2, Y1, and Y2, some being the same as those discussed above, gave a heritability in the broad sense of 0.303. A 4 × 4 diallel cross of all the possible hybrids between these four inbred lines was set up and analysed according to the procedure of GRIFFING[9] for general and specific combining abilities (Table II). The general combining ability component was significant, showing the importance of the additive genetic variance σ_A^2. The value of the heritability in the narrow sense, namely σ_A^2/σ_P^2 came to 0.098, and in the broad sense 0.119.

Table I. (a) Mean durations of copulation (in min) for the 5 inbred lines. Each mean is based on 26 observations

Generation	Lines N1	N2	D5	G5	Y2	Total mean
1	18.6	15.8	21.0	20.0	18.4	18.5
2	20.0	17.6	21.9	19.2	18.1	19.4
Combined mean	19.3	16.7	21.4	19.5	18.2	18.9

(b) Analysis of variance combining the two generations

Source	d.f.	M.S.	F	P
Lines	4	172.754	12.34	< 0.1%
Error	255	14.003		

These various experiments clearly show that the duration of copulation is controlled genetically with a heritability probably in the region of 0.15 to 0.20. The low value obtained in the diallel cross is perhaps surprising, but it must be remembered that the heritability of a trait is a property of the population under study and not of the trait itself.

Table II. Analysis of variance for a 4 × 4 diallel cross (omitting the 4 inbred lines following model 3 of GRIFFING[9])

Source	d.f.	M.S.	F	P
General combining ability	3	25.383	3.38	< 2.5%
Specific combining ability	2	10.825	1.43	
Reciprocal effects	6	16.467	2.17	~ 5.0%
Error	109	7.594		

Résumé. Une série d'expériences tend à montrer que chez *Drosophila melanogaster* la structure génétique joue un rôle déterminant dans la durée de l'accouplement.

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Nystagmus Evoked in the Rabbit by Electrical Stimulation of the Lateral Geniculate Body

In previous publications[1,2] we have shown that unilateral stimulation of the optic nerve, optic tract or superior colliculus in the rabbit produces 'central nystagmus'. Since the majority of optic fibres run through or synapse in the corpus geniculatum laterale (CGL), it was expected that electrical excitation of this structure would also evoke a nystagmus response. Central nystagmus was first elicited from the so-called 'diencephalic nystagmogenic area'[3]. The question arises whether this region is also part of the optic pathway, in view of the identification of central nystagmus as a subclass of optic nystagmus[4].

Systematic exploration of the CGL with concentric stainless steel electrodes gave the results shown in Figure 1. In plane D (atlas of MONNIER and GANGLOFF[5]), the threshold intensity fell markedly when the electrode, moving downward, penetrated into the CGL, and rose again when the ventral border of this structure was pierced. However, positive responses with a low threshold were also encountered outside the CGL, especially in the optic radiation.

The nystagmogenic area, marked in Figure 1 medial to the lateral geniculate body, was originally delineated with the help of unipolar electrodes[3]. It is evident that this area comprises not only part of the CGL, but also transgeniculate fibres, running to the superior colliculus and the oculomotor and vestibular nuclei.

Among all susceptible structures, the CGL and the optic radiation manifest the lowest threshold and are therefore the most suitable substrate for studying central nystagmus. The great sensitivity of the optic radiation is rather surprising because this region contains only fibres. However, MANNI et al.[6] have described a nystagmogenic area in the cortex of the rabbit. After destruction of this region, degenerating fibres were found inter alia in the

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