Table 1. The distribution of Drosophila species in a maze when the light intensity was the same in each chamber (300 or 0 lux).

Species	Chamber I	II	III	IV	V	N
300 lux						
D. funebris	36	38	46	42	38	200
D. testacea	36	40	50	44	30	200
D. kuntzei	32	42	42	48	36	200
D. melanogaster	34	46	40	38	42	200
D. subobscura	36	44	44	40	36	200
0 lux						
D. funebris	2	20	140	30	8	200
D. testacea	6	26	122	36	10	200
D. kuntzei	10	30	122	24	14	200
D. melanogaster	10	20	132	28	10	200
D. subobscura	14	24	116	28	18	200

References: Kekić, V., D. Marinković, N. Tucić and M. Andjelković 1971, DIS 46:148; Kekić, V. and D. Marinković 1974, Behav. Genet. 4:285-300.

McInnis, D.O. Screwworm Research Laboratory, Mission, Texas. Estimation of the attractive radius for a Drosophila collection trap.

A vital factor in some estimates of density and dispersal rate in field populations of Drosophila is the attractive radius of a standard trap containing a fairly fixed amount of bait. Each trap here consisted of a 2-gallon wax-paper bucket containing two fermenting bananas as bait.

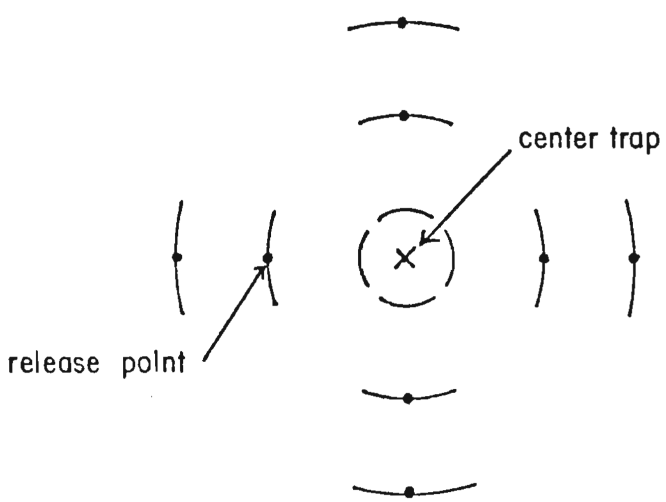

Fig. 1. Design for attractive radius determination.

Several experiments run at Schenck Forest, a pine forest in Raleigh, North Carolina, early in the summer of 1977, were directed toward estimating the attractiveness of individual traps used in a study of dispersal rate in Drosophila. The procedure involved marking and releasing flies at various distances (10 meter intervals out to 50 meters) from a central point, such that at each distance flies were marked with a differently colored dust (a micronized fluorescent pigment from Helecon Industries, U.S. Radium Corp.). An attempt was made to minimize overcrowding by releasing small numbers of flies at each of several points (at least four) around concentric circles at the specified distances (Fig. 1). Then, after one full day of elapsed time, flies were collected by swinging a net above a trap located at the center. After returning to the lab, marked flies were separated from unmarked flies after shining a U.V. lamp upon the samples. The proportion of released flies from a certain distance trapped at the center is illustrated in Fig. 2. A trap placed in a relatively sheltered site yielded a greater percentage of recaptured Drosophila at all distances compared to a trap placed in a more open area. For both traps the distances at which a trap's power to attract reaches zero (i.e., the attractive radius) is estimated to be approximately 60 meters from the best fitting lines of linear regression.

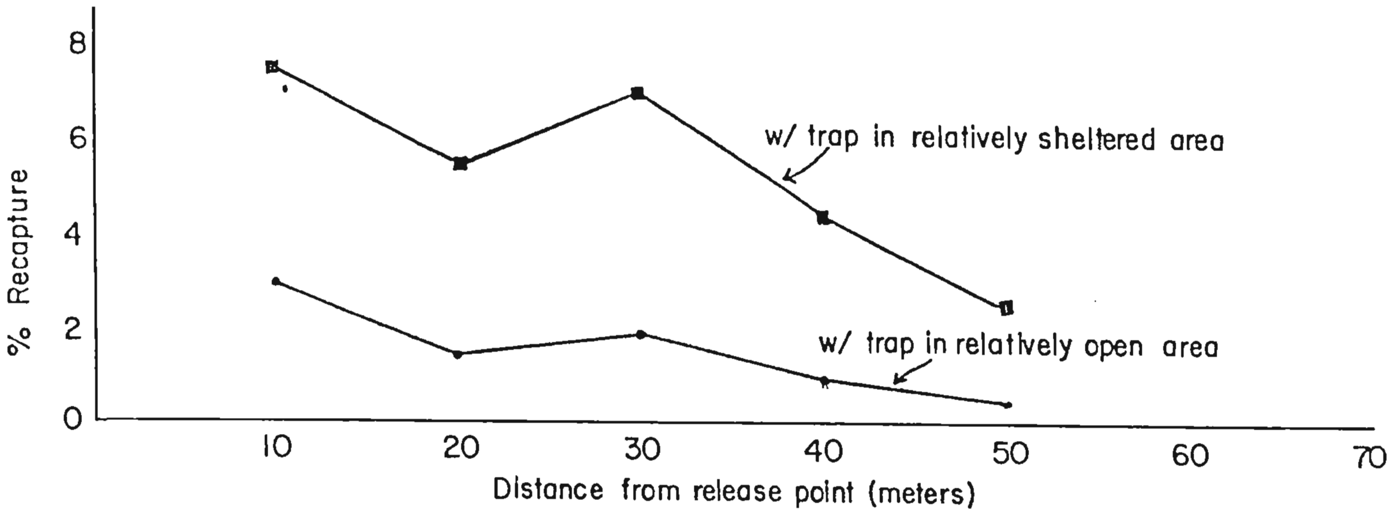

Fig. 2. Attractive radius experiments.

Platt, S.A. and M. Holliday. University of Illinois, Champaign, Illinois. A versatile apparatus for the demonstration of and selective breeding for discrimination learning in individual D. melanogaster.

Once instrumental learning has been demonstrated in individual Drosophila (Platt, Holliday and Drudge 1980), many questions concerning the parameters of the learning behavior can be investigated (e.g., what are the effects of delay of reinforcement; what is the duration of retention and memory) and the proposed components of learning might be teased apart by selective breeding and a behavior-genetic analysis. The apparatus we are currently using to attempt to selectively breed for learning is versatile, inexpensive and easily adaptable to various critical control procedures to insure that learning is, in fact, occurring and selection is being carried out on the behavior change (learning) and not upon some stereotyped or biased response pattern.

Our apparatus is constructed of modified Beral dropping pipets (Stock #B-75-100). Horizontal arms of the choice points were made by cutting the straight tubing section from the pipet and drilling a small hole in the center for receiving a pipet tip (the pipet tip was cut back about 1 cm to permit the fly to move through). In pipets to be used for the vertical alleyways, a hole was cut near the bottom to insert one arm of the T. A perforated cap cut from a pipet bulb was placed over the other arm of the T to form the cul-de-sac.

Recently we have made several useful refinements. A small ring of vinyl tubing is slid over each end of the horizontal arm. The outside diameter of the tubing ring matches the inside diameter of the cut bulb and cap. This prevents escape of the subjects and facilitates the rapid reversal of the choice point arms. About one-half of the bulb at the bottom of the vertical alley is cut off, perforated and inserted inverted. This prevents the occasional fly from descending into the bulb. We now use two different textures of white paper inside each arm of the choice points. Therefore, it is no longer possible for a fly to avoid exposure to the discriminative stimulus at the choice point. In addition, we now introduce each fly to a brief maze pre-exposure of choice points and vertical alleys all leading to the first choice point with discriminative stimuli. The pre-exposure is thought to acclimate the subject to the apparatus and reduce excessive initial choice point exploration.

Reference: Platt, S.A., M. Holliday and O.W. Drudge 1980, J. Exp. Psych: Anim. Behav. Proc. 6(4): in press.