The critical points in the technique are: (1) the grafting must be performed rapidly while the veins are still 'bleeding'; (2) a suitable easily handled paper tape must be used. The very sticky, easily curled 'Cellophane' tapes used for sealing purposes are unsuitable.

Initial trials of this technique on lilies growing outdoors, without recourse to humid chambers considered necessary for difficult grafts, showed that lily leaves so united usually remained green and turgid for at least 30 days; occasional leaves for more than two months. It is not claimed that a true graft union developed; but exchange of vascular fluids did occur as witnessed by long life of the attached leaf part and significant transfer of a hitherto 'non-transmissible virus'.

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GENETICS

Effect of Supernumerary Chromosomes on Sex Ratio in *Calligrapha philadelphica* L. (Coleoptera: Chrysomelidae)

Supernumerary chromosomes occur sporadically in plants and animals. In the animal kingdom, they have been observed in at least 50 insects and two turbellarians, and they may be present or absent in different populations of the same species[1]. They are generally considered to be inert as they are usually heterochromatic and their carriers are not distinguishable morphologically. The chromosomal polymorphism that they confer on some populations suggests that they play an adaptive part in the success of the population[1,2]. In plants supernumerary chromosomes have a harmful effect on vigour and fertility, and the effect becomes more pronounced as their number increases[3]. The work of Lewis[4] and Frost[5] has suggested that their presence may be an adaptation to arid regions[3].

This report concerns *Calligrapha philadelphica* L., one of 17 species of the genus that I have examined cytologically. Most of the species, including *C. philadelphica*, are bisexual, but six are obligatorily parthenogenetic. The adults hibernate in the ground in winter and emerge in the spring to mate (if bisexual) and lay eggs. There is a single generation each year. The bisexual species have a basic chromosome formula of $n = 11 + XO$ ($2n = 23♂$, $24♀$), which in some species is modified by the presence or absence of supernumerary chromosomes in colonies from different localities. The parthenogenetic species are ameiotic tetraploids ($4n = 48$). Bisexual *C. philadelphica* was found in 1961 to contain 5–8 univalent supernumerary chromosomes per individual in a colony at Berthierville, Quebec, and none in a colony at Ottawa, Ontario. Accordingly, it was clear that a cross might provide some interesting hybrids.

In two years of collecting and rearing, the sex ratio from each colony was virtually 50 : 50. In 1963, chromosome samples indicated that the colonies had not changed with regard to the presence or absence of supernumerary chromosomes. Because of technical limitations only a one-way cross, that is, males from Berthierville with females from Ottawa, has been attempted this year. Two lots, *A* and *B*, containing two males and three females, and three males and two females, respectively, were bred and reared separately. Lot *A* yielded 18 adult progeny, lot *B* 14, from a total of 43 young larvæ. All the progeny were female. At the same time 39 Berthierville control females were allowed to mate in lots of two to five individuals, and these yielded 218 female and 199 male progeny, derived from 900 young larvæ. In other words, the number of females per female parent was 6·4 in the test cross and 5·5 in the control, so that the yield of female progeny in the two samples was not very different. However, the figure 5·5 actually represents 52·5 per cent of the total progeny whereas 6·4 represents 100 per cent, that is to say, the test cross gave only females. The survival-rate from young larva to adult was 46 per cent in the control and 74 per cent in the test cross, and as this certainly does not indicate an excessive mortality in the larval stage of the test group it is suggested that the male component was lost at fertilization or in the egg stage.

Thus the male sex in *C. philadelphica* is not represented in the adult progeny of a cross between females from the Ottawa colony and the males from Berthierville, and the most probable explanation is that this result depends on the addition of supernumerary chromosomes originating from the Berthierville colony. Further experiments with the surviving 32 female adults of the test cross as well as adults from laboratory-reared stock from both localities are in progress.

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PSYCHOLOGY

Effect of Pentobarbital Sodium on Sleep Latency and Length of Sleep in the Rat

The effects of repeated dosages of pentobarbital sodium on two sleep responses in the rat have been investigated. The responses observed were sleep latency (the time between drug injection and an observed sleep response) and sleep length (the time between the observed sleep response and arousal). The dosage used was purposely designed to obtain a significant delay between injection and the sleep response. The study was an outgrowth of an attempt to produce, in a minimally distracting environment, a low variability but delayed sleep latency which would be susceptible to systematically introduced environmental sleep distractors. The investigations are a part of a larger programme directed toward determining the environmental antecedents of sleep.

The experimental observations were carried out in a sound-deadened room maintained at 70° F and kept dimly lighted during the experiment.

Injections were given intraperitoneally in a dose of 20 mg pentobarbital sodium/100 g body-wt. A solution containing 16·7 mg/c.c. of pentobarbital sodium was freshly prepared each day.

All animals were adult males of the Long-Evans hooded variety. The four animals in the first experiment were 140 days old at the beginning of the experiment. The six animals of the second experiment were 190 days old at the beginning of the experiment. These animals had free access to food and water except for the period in which they were in experimental cages.

After injection, the animals were placed in individual observation cages which were 10 in. × 7 in. × 7 in. made of meshed galvanized wire. The time of sleep onset was measured to the nearest second. Sleep onset was determined by observational means. The animal was considered asleep when it lay down, body flaccid, respiration shallow, no gross movements occurring, and would not respond to an object waved in front of its eyes. Total length of sleep was measured to the nearest minute starting with the first appearance of the sleep response until arousal. The animal was considered awake when it responded to