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## Pregnancy-block in *Microtus agrestis* and Induced Ovulator

A DECREASE in the incidence of pregnancy is caused by exposing recently inseminated female mice to the presence of strange males[1]. This "Bruce effect" has been demonstrated in the albino mouse, *Mus musculus*, and the deer mouse, *Peromyscus maniculatus bairdii*[2], both of which are spontaneous ovulators[3,4]. The reduction in the number of pregnancies has been shown to be a consequence of the failure of the fertilized ova to implant and the effect of the strange male is mediated by olfactory stimuli[5,6]. Other environmental factors can also block pregnancy[2].

An experiment was carried out to see whether in the field vole, *Microtus agrestis*, the occurrence of pregnancy could be influenced by exposing recently mated females to strange males. It is known that *M. agrestis* is an induced ovulator[7,8], in which ovulation occurs 8–12 h after coitus and is indicated by a leucocytic vaginal smear[9]. Implantation follows 3–5 days after coitus[9].

The experiment was carried out in March and April 1968 in controlled conditions of lighting (16 h light; 8 h dark) and temperature (20° ± 1° C), using sexually mature females produced in the breeding colony maintained in this department. Each female was placed, for two days, in a plastic breeding cage (24 × 14 × 10 cm) with a fertile male and was then transferred to another clean plastic cage either with the original (stud) male or with a strange male. Twenty-four hours exposure to the second situation was followed by isolation of each female in a wire-mesh cage (28 × 18 × 12 cm) for 3 weeks. The gestation period of the field vole is about 3 weeks[10].

While in plastic cages, animals were provided with oats and water *ad libitum*, but cover was omitted so that the voles could be watched. In the wire-mesh cages they were given oats and water, *ad libitum*, hay and carrots twice a week and cover in the form of non-absorbent cotton wool at all times.

Using a platinum wire loop, daily vaginal smears were taken before, during and after caging with males. On a number of occasions males were actually seen to mount females, but sperm were not always present in vaginal smears taken subsequent to these events. Three criteria were used to establish whether coitus had occurred in any particular pairing: (1) the presence of a vaginal plug; (2) sperm in the vaginal smear; and (3) a marked invasion by leucocytes of a smear pattern which had previously consisted of cornified or nucleated cells. Usually at least two of these criteria were satisfied for each of the matings described below.

Of twenty females which separately mated with stud males and subsequently remained with them, sixteen produced litters. In the other four females the vaginal smears changed a few days after coitus from leucocytic to cornified or nucleated cells and no litters were produced.

Of another twenty females which mated with stud males and which were then exposed to strange males, only five produced litters. In the other fifteen animals the vaginal smears returned to the non-pregnant type within 5 days of coitus.

The difference in the proportion of pregnant to non-pregnant females in the two treatments is statistically significant ($\chi_1^2 = 10{\cdot}03$, $P < 0{\cdot}005$).

Thus, in laboratory conditions, exposure of recently mated female *M. agrestis* to strange males blocks pregnancy. While one cannot extrapolate simply from this laboratory finding to the field situation, it is possible that social interaction, leading to pregnancy-block, may play a part in regulating population levels in the wild.

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## Photoperiodic Control of Flowering and Anthocyanin Formation in *Fuchsia*

MEASUREMENTS of the rates at which phytochrome $P_{730}$ reverts to $P_{660}$ in the dark have not been made for green plants because of the low concentrations of phytochrome and high chlorophyll content. Estimates based on physiological experiments have indicated that the time taken for reversion varies in different species from less than 3 h[1,2] to more than 72 h[3]. *In vivo* spectrophotometric measurements on tissues containing no chlorophyll have indicated that there may be a fast and a slow component of $P_{730}$ reversion: although a considerable amount had disappeared after 2 h of darkness, some still persisted after 12 h[4]. Results from physiological studies on flowering and anthocyanin formation in the long-day plant *Fuchsia* reported here are consistent with this.

Plants of *Fuchsia* cultivar 'Lord Byron' were maintained in short photoperiods (0800 h–1600 h) until they had two–four pairs of expanded leaves, when the long-day treatments began. The minimum night temperature was 15°–16° C; day temperatures were higher but were usually below 26° C. The red (600–700 nm) and far-red