In uncrowded conditions, the acute toxicities of neither dexamphetamine nor fencamfamin were altered by steroid pretreatment. Under crowded conditions, the usual increase in dexamphetamine toxicity was still further increased by mestranol but unchanged after lynestrenol. Crowding normally increases the toxicity of fencamfamin only marginally; steroid pretreatment was without effect on its toxicity in crowded conditions.

Finally, the effects of lynestrenol (10 mg/kg) and mestranol (1 mg/kg) on brain amine levels were studied. Using the spectrophotofluorometric assay method of Spencer & Turner (1969) whole-brain levels of dopamine, noradrenaline and 5-hydroxytryptamine were determined after pretreatment with steroid for 6 days. The levels of each amine were slightly reduced with lynestrenol ($P=0{\cdot}1$ to $0{\cdot}05$), while 5-hydroxytryptamine was increased with mestranol ($P=0{\cdot}1$ to $0{\cdot}05$).

If the actions of dexamphetamine (and fencamfamin) are due predominantly to the release of endogenous amines, then an increase (with lynestrenol) or a decrease (with mestranol) of tissue MAO activity should change the potency of these two stimulant drugs. Since Hotovy, Enenkel, Gillisen, Hoffmann, Jahn, Kraft, Muller-Calgan, Sommer & Struller (1961) showed that the peripheral effects of fencamfamin were weaker than those of dexamphetamine, it might be expected that the peripheral effects of dexamphetamine would be the most affected by steroid pretreatment. Our results support this. Mestranol potentiated dexamphetamine-induced hyperthermia and aggregation toxicity (enhanced by hyperthermia) to a greater degree than those induced by fencamfamin. However, the effects of both drugs on locomotor activity (assumed to be a central effect) were affected similarly by steroid pretreatment.

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Ambient temperature and thermal responses to hexamethonium in the mouse

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There is ample evidence that ambient temperature (T_A) can markedly affect the thermal responses to drugs (for example, Shemano & Nickerson, 1958). We have investigated the effect of a single intraperitoneal (I.P.) injection of hexamethonium bromide (10 or 40 mg/kg) on the rectal temperature of mice, at three ambient temperatures. Two hours before the experiment, mice (5–10 per group) were removed

from the animal house (22–24° C) and placed in individual compartments without restraint. Rectal temperatures were measured using a thermistor probe inserted to a depth of 1 cm. Hexamethonium bromide was injected at zero time and measurements of rectal temperature taken at 15 min intervals for the following hour. Rectal temperatures were also taken 15 min before the injection of the hexamethonium or saline.

At T_A 23 ± 1° C hexamethonium bromide (10 mg/kg I.P.) had no significant effect, but 40 mg/kg caused a marked fall in rectal temperature which attained its maximum value after 30 min. At T_A 5 ± 1° C, however, hexamethonium bromide (10 mg/kg) caused a fall in rectal temperature which reached its maximum after 15 min. At T_A 34 ± 1° C, hexamethonium bromide (10 mg/kg) produced a rise in rectal temperature which was significant only after 45 min and which had not decreased after 1 hr.

Other mice made hypothermic with reserpine (4 mg/kg) 20 hr before the experiment showed a response to hexamethonium which was different from that of normal mice. At T_A 23 ± 1° C the rectal temperatures of the reserpinized mice were rising. Whereas hexamethonium bromide (10 mg/kg) had no effect on the rate of rise of rectal temperature, 40 mg/kg decreased it. At T_A 5 ± 1° C the rectal temperatures of the reserpinized mice were falling and hexamethonium bromide (10 mg/kg) increased the rate of fall. The degree of hypothermia of reserpinized mice at T_A 34 ± 1° C was less than that at T_A 23° C. The rectal temperatures at T_A 34° C continued to rise throughout the experimen al period and were not affected by hexamethonium bromide (40 mg/kg).

The results show that in normal mice, hexamethonium can cause a rise or fall of rectal temperature. These effects may be due to a blockade of vasoconstriction causing a redistribution of blood to the skin at low T_A and to the core at high T_A, in the former case heat conservation being blocked and in the latter, heat transfer from core to periphery being prevented.

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Nicotine uptake by isolated rat ganglia

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The cat superior cervical ganglion retains a higher concentration of nicotine than the adjacent nodose (afferent vagal) ganglion after close-arterial injection of nicotine to the two ganglia *in vivo* (Appelgren, Hansson & Schmiterlow, 1963; Brown, Hoffmann & Roth, 1969). Since only the superior cervical ganglion responds to nicotine (Langley & Dickinson, 1889; Brown *et al.*, 1969), this suggests that the neuronal uptake of nicotine might be related to the amount of depolarization.

In the present experiments, the uptake of ^{3}H-nicotine by isolated rat superior cervical sympathetic and nodose ganglia has been studied. Ganglia were incubated in Krebs solution at room temperature (19°–24° C), bubbled with 95% oxygen/5%