induced the masculine copulatory behavior but only androgen induced crowing and increased or induced the "tidbitting" and "waltzing". In bilaterally ovariectomized poulards, androgen induced crowing and waltzing but did not induce the masculine copulatory behavior while estrogen, on the contrary, induced the feminine squatting behavior. These results would seem to suggest that certain behavior patterns are common to both sexes of the fowl and may be induced by the appropriate hormone. . The masculine copulatory behavior can be induced by both androgen and estrogen but only in genetically determined males.

13422 P

Toxicity of Intravenous Paraldehyde.

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Intravenous paraldehyde for anesthesia of short duration has been advocated frequently by clinicians.[1-4] The rapid induction and quick recovery following its use have been factors in formulating the impression that it is without toxic effects. The numerous clinical reports contrast sharply with the paucity of experimental investigations, and this stimulated a study to determine the safety of intravenous paraldehyde administration in experimental animals. In accordance with the regularly recommended clinical practice the drug was injected intravenously undiluted, at the rate of 0.5 cc per second.

Thirty cats, 20 dogs and 20 rabbits were used.

The Minimum Anesthetic Dose (smallest dose that produced anesthesia) was found to be 0.3 cc per kilo body weight in all 3 species. The Minimum Lethal Dose (dose at which 50% of the animals died) was found to be 0.45 cc per kilo (cats, rabbits) and 0.50 cc per kilo (dogs). These figures demonstrate a margin of safety of low order.

Autopsy findings in the animals given lethal doses were similar.

1 Noel, H. L. C., and Souttar, H. S., *Lancet*, 1912, **2**, 818.

2 Beauchemin, J. A., Springer, R. G., and Elliott, G. A., *M. Times and Long Island M. J.*, 1935, **63**, 179.

3 Miller, A. H., *Anesth. and Analg.*, 1936, **15**, 14.

4 Robinson, L. J., *New Eng. J. Med.*, 1938, **219**, 114.

Those expiring within 10 minutes following intravenous paraldehyde had massive diffuse pulmonary hemorrhage and dilatation of the right heart. When death occurred 6 to 24 hours after anesthesia, acute pulmonary edema was evident. Animals recovered from anesthetic doses looked poorly. After one week autopsy revealed multiple pulmonary hemorrhages. Histo-pathological changes in other viscera were also observed. A further investigation of these is in progress.

Other observations during this study were directed toward respiratory and circulatory reactions.

In accord with clinical reports the respiratory rate was increased. Immediately after intravenous injection of paraldehyde there was often an apnea for several seconds. This was followed by rapid, shallow respirations; the rate increasing from 16-20 to as much as 120 per minute. Coughing was observed frequently and cyanosis was noted which became progressively more intense.

With doses producing anesthesia there was a prompt decrease in arterial blood pressure and an accelerated pulse rate. Even in animals which survived 12 to 24 hours, there was an immediate fall in the arterial blood pressure of more than 50%.

Conclusion. The intravenous administration of paraldehyde as recommended for clinical anesthesia is not without danger. In experimental animals there is a narrow margin of safety (Minimum Anesthetic Dose-Minimum Lethal Dose). Massive diffuse pulmonary hemorrhages and dilatation of the right heart occur when animals are killed with minimum lethal doses. Pulmonary hemorrhages are present in animals having recovered from anesthetic doses.

13423 P

Metabolism in Perfused Dog's Head During Sodium Pentobarbital Depression ann Metrazol* Stimulation.

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Previous studies on the effects of central nervous system depressants on brain metabolism have been largely confined to *in vitro* measurements of the oxygen consumption of minced brain tissue or

* Metrazol was supplied by the Bilhuber-Knoll Corporation.