number of cases was studied but our results indicate a less ready, and a less varied, response of the bird to this substance than has been found for mammals.

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Heavy alcoholization and prenatal mortality in mice.

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A previous investigation[1] has shown that treating female mice with light doses of alcohol fumes (beginning at 4 weeks, every day for 45 minutes in a pint bottle with 3 cc. alcohol) does not modify the prenatal mortality or any other phase of their reproduction. In the present study the same technique for administering the alcohol has been used, but each mouse was left in its bottle until in a state of deep anesthesia 5 days per week. This required 1 to 2 hours for mature mice. Experimental animals were mated at 4 weeks, and on the day of birth the mothers were returned from their isolation in pregnancy boxes to mating pens, without their young. The results are based on the number of corpora lutea associated with each successive litter of young born; the difference between the number of corpora lutea and the number of young is called the prenatal mortality. The technique of counting the corpora lutea has been described[2] and the reliability of this criterion of prenatal mortality discussed[3].

Two main series of experiments have been performed. In the first series the mothers only were treated (data from 657 litters). The unit experiment was a litter of 4 to 6 females half of which were treated. All lived in the same pen, mated to the same male, an older sib previously found fertile.

In the second series of experiments the fathers only were

[1] MacDowell, E. C., PROC. SOC. EXP. BIOL. AND MED., 1924, xxi, 480.

[2] MacDowell, E. C., *Anat. Rec.*, 1924, xxvii, 329.

[3] MacDowell, E. C., and Lord, E. M., *Am. J. Anat.*, 1926, xxxvii, 127.

treated. The unit experiment[4] consisted of 2 treated and 2 control males from the same litter and 16 to 20 females from a different stock 2 to 3 weeks older than the males. They were divided equally between the 4 males for their first litter, and mated in turn with each of the other males for successive litters, always alternating treated and control males. In four of the unit experiments males from the inbred Bagg albino line were used (data from 452 litters); in four other experiments males from the still more inbred Dilute brown line were used (data from 387 litters).

	Order of litter.							
	1st	2nd	3rd	4th	5th	6th	7th	8th
Females treated								
Treated litters	64	63	57	46	33	22	10	7
Per cent P. mort.	45.2	51.7	55.7	61.8	69.7	74.4	74.3	67.9
Control litters	67	66	61	54	46	37	15	9
Per cent P. mort.	32.6	43.1	50.2	50.3	58.1	63.3	74.7	64.4
Males treated								
B. alb. treated litters	50	46	47	33	24	9	9	3
Per cent P. mort.	26.3	25.5	38.3	39.5	55.3	69.5	68.6	84.6
B. alb. control litters	57	53	38	34	16	19	6	8
Per cent P. mort.	22.2	28.6	40.9	39.3	63.1	58.7	64.8	75.7
D. br. treated litters	47	39	41	27	17	7	7	3
Per cent P. mort.	27.9	46.2	46.0	54.3	69.4	49.2	71.6	55.6
D. br. control litters	49	48	32	35	11	13	4	7
Per cent P. mort.	33.7	34.8	43.6	51.5	46.5	67.2	55.6	72.7

Since the order of the litter has been found[5] to have a strong influence on the amount of prenatal mortality, the summary given is subdivided according to parity. The figures in the body of the table are the number of litters and the per cent prenatal morality calculated from the total number of corpora lutea and young.

The prenatal mortality of the treated mothers is greater than for the controls in every case but for 7th litters; 1st, 4th, 5th and 6th litters give differences greater than 10 per cent. Treatment of the females with heavy doses of alcohol increases the prenatal mortality of the embryos.

Treatment of the Bagg albino males appears to have no con-

[4] MacDowell, E. C., Lord, E. M., and MacDowell, C. G., PROC. SOC. EXP. BIOL. AND MED., 1926, xxiii, 517.

[5] MacDowell, E. C., and Lord, E. M., *Anat. Rec.*, 1924, xxix, 141.

sistent effect on the prenatal mortality. With the exception of the per cents for 6th, 7th and 8th litters, which have the smallest numbers, the prenatal mortality for litters from the test and control males is very nearly the same.

The prenatal mortality for treated Dilute brown males is higher than the controls for the 2nd, 3rd, 4th, 5th and 7th litters, but counting only equal numbers of litters from each female from treated and control fathers, and ignoring parity, the per cent prenatal mortality for litters from treated fathers is 0.1 per cent less than the controls. A similar summary for Bagg albino males shows the treated fathers give litters with 1.01 ± 0.82 per cent more prenatal mortality.

It is concluded that no clear effect of the heavy treatment of the fathers can be found on the prenatal mortality in their litters. On the other hand, a difference in prenatal mortality is found between the litters from Bagg albino and Dilute brown males whether they are from treated or control fathers. Since all the females were from the same, third, strain and the methods of the experiment seem effectively to remove any other explanation, the greater prenatal mortality of the Dilute brown males may be accepted as due to a strain difference manifest in the sperm.

No other work is known in which prenatal mortality as here defined has been used as the criterion of the effect of any treatment, although various authors[6] have reported prenatal mortality based on autopsy counts of corpora lutea of pregnancy in various animals. Stockard[7] gives data on prenatal mortality in alcoholic guinea pigs but this is based only on deaths of foetuses large enough to be counted by palpation. He reports that the treatment of the fathers alone increases the prenatal mortality as much as the treatment of the mothers alone. It is clear that this conclusion is not supported by the present results from mice.

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[6] Hammond, J., *J. Agric. Sci.*, 1921, xi, 337; Corner, G. W., *Am. J. Anat.*, 1923, xxxi, 523; Long, J. H., and Evans, H. M., *Mem. Univ. Cal.*, 1922, vi; Parkes, A. S., *Proc. Roy. Soc.*, 1923, xcv, 551.

[7] Stockard, C. R., *Proc. Am. Phil. Soc.*, 1923, lxii, 311.