

dicates that demerol, like trasentin, has local anesthetic properties and Everett¹¹ in this laboratory has demonstrated that "dolphine" produces local anesthesia in the rabbit's cornea. Thus, the local anesthetic property, as well as musculotropic spasmolysis seems to be common to trasentin, demerol and "dolphine."

¹¹ Everett, F. G., personal communication.

Summary. Isolated strips of rabbit intestine and rat and rabbit uteri respond with spasmolysis when treated with "dolphine" and demerol when spasm is induced with furmethide or Methergine. The ratio of spasmolytic concentration is approximately 1:1 although rabbit uteri required slightly more dolophine than demerol for spasmolysis.

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Induction of Male Copulatory Behavior in the Brown Leghorn Hen.*

L. V. DOMM AND BEN B. BLIVAISS.

From the Whitman Laboratory of Experimental Zoology, The University of Chicago.

Previous experiments have shown that daily injections of testosterone propionate in poulards¹ and pullets² will induce masculinization of somatic sex characters and behavior. These individuals crowed, became combative, and displayed male courtship but no copulatory behavior, even though injections were continued for periods up to 7 months. The absence of this phase of behavior has long baffled investigators in view of the ease with which other sexual characters may be masculinized in the fowl. Two incidental cases are recorded^{3,4} in which hens revealed male copulatory behavior, although neither instance is based on extensive experimentation. The present experiments, in progress for over 4 years, show that masculine copulatory behavior may be induced and maintained in some pullets following suc-

cessive implantations of androgen pellets.

Each of 4 non-laying pullets (A, BW, G, and GA) received subcutaneous implantations of testosterone propionate pellets (average weight, 33.4 mg) when 5 months old and subsequently at 84, 164, 244, 337, 425, 530, 630, and 727 days. Two control pullets (B and W) received implantations of cholesterol pellets averaging 32.6 mg. Pellet implantations were repeated upon absorption, determined by palpation and comb regression. The behavior was tested, generally on alternate days, by introducing each bird, alone in its pen, to a female, to a male, or to a dummy female mounted in the squatting, copulatory position.

Experimental pullet A was first observed to crow at 34 days, to chase, grab, and attempt mounting at 95 days, to grab, mount, and copulate at 110 (age 262), and to waltz and circle at 114 days after the first implant. Pullet BW was also first observed to crow at 34, chase, grab, and attempt mounting at 95, mount and copulate at 103 (age 255), and waltz and circle at 127 days. A continued to copulate for 5 months, when it died, and BW for 8 months after the final implant. Courtship activity preliminary to copulation, never very vigorous, was frequently absent. In no instance did they indicate receptivity by squatting at the approach of the male.

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¹ Davis, David E., and Domm, L. V., *Proc. Soc. Exp. Biol. and Med.*, 1941, **48**, 667; *Essays in Biology*, University of Calif. Press., 1943, 171.

² Domm, L. V., Davis, David E., and Blivaiss, Ben B., *Anat. Rec.*, 1942, **84** (Suppl.), 31.

³ Domm, L. V., *J. Exp. Zool.*, 1927, **48**, 31.

⁴ Zitrin, A., *Endocrinology*, 1942, **31**, 690.

The other pullets (G and GA) displayed courtship but no masculine copulatory behavior during the period of observations.

In the second group, 6 pullets received their first pellet at one month and further implants (average, 25.9 mg) at 109, 202, 297, 395, 495, and 592 days thereafter. One bird, G, was first observed to crow at 125, chase at 126, waltz and circle at 141, and to mount and copulate at 161 days (age 191) after the first implant. Sporadic copulations occurred until 11 months after final implantation. The other 5 birds began to crow and display courtship at approximately the same time as G but did not mount or copulate.

In a third group, 8 pullets received pellet implantations beginning at 4 days and additional implants (average, 23.2 mg) at 62 and 172 days. In this group, only one bird crowed and another was observed to waltz and circle.

In the fourth group, 6 pullets received the first pellet when 3 months old and further implants (average, 28.2 mg) at 80, 185, 317,[†] and 436 days subsequently. All were known to crow and 3 displayed courtship behavior. No copulations were observed.

A standard trap-nest was kept in all pens throughout the experiments. One treading pul-

let (A) never laid. It died 871 days after first implantation. The other treader (BW) laid 6 eggs between the 69th and 80th days following second implantation, and 3 more after a lapse of one year following the last implant. During the 4 years of observation the non-treading pullet G laid 6 eggs between 57th and 74th days, and GA only one egg on 79th day after second implantation.

In the second experiment, treading hen G, as well as 3 non-treaders, never laid over a span of 3 years. One non-treading hen laid an egg at 4 months after the first, and another laid one egg at 2 years after the last implant. Similar records of sporadic egg-laying were obtained in the other experiments, while some controls laid as many as 21 eggs per month.

Summary. Three cases are described from 4 experimental groups totaling 24 birds, some observed for more than 4 years, in which single comb brown Leghorn hens displayed male copulatory behavior following successive implants of testosterone propionate pellets. Implantations were begun when birds were 4 days, and 1, 3, and 5 months old. These results contrast with earlier negative findings following single daily injections of this hormone. Induction of copulatory behavior in such a small percentage of cases indicates the desirability for further study of factors controlling this behavior pattern.

[†] At the time of the second, third, and fourth implantations, 3 of the pullets received 2 pellets each. The average weight of both was 57.1 mg.

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Incidence of Rh Factor Among the Indians of the Southwest.

EARL B. GERHEIM.* (Introduced by John H. Ferguson.)

From the Department of Physiology, University of North Carolina School of Medicine, Chapel Hill, N. C.

Within the last 12 years the Indians of the Southwest have been investigated as to the occurrence of the various agglutinogens. Allen and Schaeffer¹ reported on the classic blood groups, and Allen and Larsen² reported their

findings on the M and N agglutinogens. The basis of this report is the Rh factor among the above mentioned Indians.

¹ Allen, F. W., and Schaeffer, W., *Univ. N. Mex. Bull. Biol. Series*, 1935, **4**, 2.

² Allen, F. W., and Larsen, H. D., *J. Immunol.*, 1937, **32**, 301.

* Junior Research Fellow from the National Institute of Health.