

of medium per mother, produced an average of 13.1 young per mother, of which but 6.3% were males. The percentages of male young in the various experimental vials ranged from 0% to 21%.

A most interesting fact brought out by these experiments is that the mothers in 5 of the vials produced an average of 14.0 young per mother of which 100% were females. This would seem to indicate that the detrimental effect of crowding and excretory substances had been entirely overcome in 5 cases by the addition of an adequate amount of food. The importance of the food factor in these experiments will be realized when one considers that Cooper, Stuart and Miller⁴ have shown that 9 mothers reared in 2 ml. of un bacterized medium in similar vials, though they may survive for relatively long periods of time, rarely produce any young at all. It has been shown, therefore, that in certain cases, even with an extreme of crowding but with an adequate supply of living bacteria, Cladoceran mothers may produce female young.

The addition of "cell juice" appeared to favor the growth of Cladoceran mothers, as animals reared simply in bacterized manure infusions did not seem to thrive as well. We are inclined, however, to believe that the "cell juice" possessed little if any nutritive value for the Cladocera, but that it did furnish an excellent substrate for the growth of the added bacteria.

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Depression Periods in Cladocera.

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For more than 3 years the writer has been interested in the periodic depressions that so frequently occur in stock cultures of Cladocera reared in manure infusions. Such periods have been reported by Warren,¹ Hartman,² and Allee.³ Stuart, Cooper and Coady⁴ believed that no one environmental factor was responsible for their occurrence and suggested several factors that might be

⁴ Cooper, H. J., Stuart, C. A., and Miller, R., *Anat. Rec.*, 1932.

¹ Warren, E., *Quart. J. Microsc. Soc.*, 1900, **48**, 199.

² Hartman, O., *Arch. f. Zellforsch.*, 1919, **15**, 1.

³ Allee, W. C., *Animal Aggregations*, Univ. Chicago Press, 1931.

⁴ Stuart, C. A., Cooper, H. J., and Coady, H., in press.

associated with the phenomenon. Since Allee³ has so clearly shown the detrimental effects of unconditioned water on aquatic animals it occurred to the writer that this factor might play some rôle in depression periods in Cladocera.

Accordingly, during a part of the summer of 1931 when stock animals showed continued depression periods the pond water employed in the preparation of medium for these animals was treated in the following way. Five gallons of the raw water was filtered through paper and together with a suitable quantity of garden soil was put into an aquarium. A few hours later, after sedimentation of the gross silt, the aquarium was stocked with 100 or more adult Cladoceran mothers (*Moina macrocopa*). In each of 6 separate experiments many of these animals died within 12 to 18 hours, and a similar number of mothers with eggs or embryos present in the brood chamber were added to the aquarium. For the most part these animals survived and released their young. The water was arbitrarily held to be conditioned in from 48 to 72 hours when a slight opalescence or turbidity appeared: this opalescence was shown by bacteriological counts to be due to the increased number of bacteria. The water was then filtered through paper and used for diluting a portion of the concentrated manure infusion employed for rearing these animals.⁵ A portion of the same concentrated infusion was also diluted with unconditioned pond water from the same lot as that used for conditioning. Single *Moina* sisters were placed in each of 2 bottles, one containing 100 ml. of the medium prepared from conditioned water, the other a similar amount of medium made from unconditioned water. If the mothers survived to release, the number of young released and the number of second eggs laid by the mothers were noted. Six series of experiments were carried out, each series consisting of from 12 to 25 separate experiments.

Of 108 mothers reared in the conditioned medium 102 survived to release 1074 young and to lay subsequently a total of 1173 eggs for the second brood. In the unconditioned medium, however, only 83 of the 108 mothers survived to release 591 young and to lay 489 second eggs. The mortality in the conditioned medium was but 5.55% while in the unconditioned medium it was 23.14%. Moreover, in the conditioned medium the average number of young and second eggs per mother was 10.52 and 11.50 respectively, while in the unconditioned medium the average young and second eggs per mother was respectively 7.12 and 5.89.

⁵ Stuart, C. A., Tallman, J., and Cooper, H. J., *Physiol. Zool.*, 1931, 4, 581.

Sister lines of the stock Moina mothers during this depression period were, therefore, reared for several weeks in both conditioned and unconditioned media. It was evident that the mothers in the conditioned medium produced more young and more second eggs at all times than the sister mothers in the unconditioned medium. The conditioned medium failed, however, in rejuvenating completely the stock from the depression period.

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Effects of Administration of Cortin to the Hypophysectomized Rat.*

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Among the results of experimental hypophysectomy in mammals are loss of weight, or, in young animals, failure to increase in weight, loss of *libido sexualis*, cessation of estrus, or sexual infantilism, lessened spontaneous activity, lowered metabolism and lowered temperature.^{1, 2, 3} Autopsy of such animals shows atrophy of the thyroid, the adrenal cortex, the gonads, the secondary sex organs, and the thymus. It is apparent that the hypophysectomized animal is characterized not only by absence of the pituitary but also by a marked reduction in size, and presumably also in function, of several other highly important endocrine glands. Considerable light has been thrown on the respective rôles of the thyroid and the gonads in this complex endocrine disturbance.^{2, 4} The functional relationships of the adrenal cortex in the above pictured syndrome are not so well known; what symptoms and what glandular deficiencies, if any, are secondary to the atrophy of this important endocrine gland following removal of the pituitary?

We have previously reported the results of cortin treatment in hypophysectomized Amphibia.⁵ In our mammalian experiments albino rats weighing from 150-200 gm., principally from the Wistar

* Aided by a grant from the Carnegie Corporation to the Carnegie Institution of Washington.

¹ Smith, P. E., *J. Am. Med. Assn.*, 1927, **88**, 158.

² Foster, G. L., and Smith, P. E., *J. Am. Med. Assn.*, 1926, **87**, 2151.

³ Richter, C. P., and Wislocki, G. B., *Am. J. Physiol.*, 1930, **95**, 481.

⁴ Smith, P. E., *Am. J. Physiol.*, 1932, **99**, 349.

⁵ Atwell, W. J., *PROC. SOC. EXP. BIOL. AND MED.*, 1932, **29**, 621.