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Inheritance in parthenogenesis and in sexual reproduction in a cladoceran.

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For some years we have been making studies with Cladocera on the occurrence of mutations and their inheritance in parthenogenesis. Four mutant characters have been studied in *Daphnia longispina*. The inheritance is complete, since every parthenogenetic young from a mutant individual genetically possesses the mutant character (except, of course, for the occasional interference of another mutation). This is in accord with expectation, in view of the absence of chromatic reduction and segregation in the maturation of the parthenogenetic (diploid) eggs in Cladocera.

It was of further interest to obtain, if possible, sexual reproduction and hybrid offspring between mutant clones and the "wild" type. Sexual eggs (haploid and requiring fertilization) are frequently obtainable, and males may usually be obtained when desired, but it is not easy to obtain, *simultaneously*, ovarian sexual eggs and functional males from just the stocks desired. When sexual eggs and active males are obtained at the same time, fertilization frequently does not occur, and the fertilized eggs

when obtained give exceedingly poor hatches, so that many fruitless attempts preceded the obtaining of the desired hybrids.

Forty hybrids have been or are now being studied and some data obtained on the inheritance of the two mutant characters involved in the stock used in the crosses. The characters involved are sex-intergradedness and "excavated" head. Twenty-nine of these hybrids are from wild type ♀ × mutant ♂, and 11 are from the reciprocal cross. Nineteen of these hybrids genetically possess the mutant character, excavated head, and 19 show sex intergradedness. It seems probable, therefore, that each of these characters is a dominant mendelian character and is heterozygous in the mutant clones used in the crosses. Further breeding and study will be necessary before the full extent of the inheritance of these characters is determined.

The absence of both these characters in all except the mutant laboratory strains, in much wild stock examined, and in sexual offspring from wild type parents, their presence and heritability in parthenogenesis in the mutant strains, and in sexual offspring from these strains, indicate that these characters are definitely heritable and behave in bi-parental inheritance like characters in bi-parental inheritance in other organisms.

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A method for preserving and counterstaining vitally-stained cells.*

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Recently, in the course of some experiments on the viability of monocytes,[1] it became necessary to preserve, for further study, cells which had been vitally stained with neutral red. The cells

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1 Sabin, F. R., Doan, C. A., and Cunningham, R. S., Contributions to Embryology No. 82, Carnegie Inst. of Wash. Pub., No. 361, 125-162.