Twenty fourth meeting.

Carnegie Institution's Station for Experimental Evolution, Cold Spring Harbor, Long Island, New York. June 22, 1907. President Flexner in the chair.

101 (244)

Demonstrations of methods and results of pedigree breeding of plants and animals.

By **CHARLES B. DAVENPORT.**

[*From the Carnegie Institution's Station for Experimental Evolution, Cold Spring Harbor, Long Island, N. Y.*]

Four series of pedigreed poultry were shown to illustrate certain laws of inheritance.

Series I. Darwin's case of "reversion":

1, Jungle fowl; 2, black minorca and 3, white silky, female; 4, their son, black with red markings as in the jungle fowl; 5, second hybrid generation, including (*a*), white type and (*b*), type with jungle fowl coloration.

Series II. The production of a frizzle-silky race:

1, Silky, male; 2, frizzle, female; 3, first hybrid generation, frizzled but not silky; 4, second hybrid generation, both frizzled and silky feathers in the same individual.

Series III. Particulate inheritance of plumage color:

1, Game colored Tosa fowl, male; 2, white cochin, female; 3, son of 1 and 2, game colored, feathers barred with white; 4, second hybrid generation: (*a*), white type; (*b*), game type.

Series IV. Independence in inheritance of the different characters:

1, White leghorn, male; 2, Houdan, female (mottled, black and white); 3, son of 1 and 2, white, small crest, Y comb, low nostril, four toes on each foot; 4, second hybrid generation, white, high nostril, no crest, heavy muff, four toes.

Demonstration of inheritance of characters in canaries.

Series I. Pure crest, crossed with crestless. Offspring all

crested. Second hybrid generation includes both crested and crestless birds.

Series II. Inheritance of plumage color: Green canaries crossed with yellow canaries give mottled offspring. Descendants of these mottled offspring include some yellow and also some green birds.

Demonstration of Œnothera (evening primrose) and its mutants.

Demonstration of branching and branchless sunflowers.

Demonstration by Miss Lutz of variability of chromosomes in Œnothera and its mutants.

Demonstration by Mr. F. E. Lutz of inheritance of abnormal wing venation in the vinegar fly, Drosophila.

102 (245)

Further studies of the effects of the exposure of sperm to X rays.

By **CHARLES R. BARDEEN.**

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Eggs of *Rana pipiens* fertilized by sperm exposed to Roentgen rays for one hour all develop abnormally. The abnormalities begin to appear during the gastrulation period. Cases of spina bifida are not uncommon. Out of a lot of several hundred eggs, nearly all of which were fertilized, only one specimen survived two weeks. This was much stunted in growth and very abnormal in shape. Out of 80 eggs of the common toad exposed only 15 minutes to the Roentgen rays but 4 larvæ have survived one month. Most of the larvæ were markedly abnormal in shape. Of the survivors, two are large and apparently normal and two are undersized. Only one individual out of 150 eggs fertilized by sperm exposed 37 minutes to the rays has survived one month and this individual is but half the normal length and breadth. Out of 250 eggs fertilized by sperm exposed to the Roentgen rays for an hour and ten minutes, all exhibited marked abnormalities of development and the least abnormal larva and longest survivor died a week after the eggs were fertilized.

The susceptibility of sperm of anura to the X rays is in marked contrast to that of paramecia. Exposure of paramecia for 12