injection. In 27 frogs the injected dose of fuchsin was less than 0.1 mgr. per grm. of body-weight. In eighteen frogs the dose was 0.05 mgm. per gram body-weight, the time of onset of convulsions varying between 4 and 15 minutes. In some of these cases the entire dose for the frog amounted to less than one milligram of the fuchsin. In a few frogs the effective dose was not more than 0.025 mgm. per gram body-weight.

We have here another instance in which the action of a substance is greatly accelerated and much more effective in animals without a circulation than in normal animals. The experiments seem to show further that the minimum toxic dose of fuchsin is for cardiectomized frogs much smaller than even for frogs with the anterior part of the brain removed.

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On the presence of dextrose in the exudate of pulmonary edema.

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Injection of adrenalin causes glycosuria and hyperglycemia. In some instances the animals which receive adrenalin die of pulmonary edema. The chemical composition of the exudate of pulmonary edema has never been investigated. An examination of the exudate of rabbits which died from pulmonary edema after receiving adrenalin revealed the presence of a considerable amount of dextrose. The causation of pulmonary edema by the injection of adrenalin is, however, a matter of mere accident and cannot be relied upon in a systematic study. After various attempts we found that inhalation of ammonia can be fairly well relied upon to produce edema and produce it in a quantity sufficient to make a quantitative test for a reducing substance. The exudate did not clot, which shows that no pure blood was mixed with it. The number of experiments, although not yet large, permits a definite preliminary report. Besides analyzing the pulmonary exudate, in most cases a quantitative analysis of the blood for reducing substances was made and in some instances also of the urine. Pulmonary edema was also produced in two normal ani-

mals and in one animal which received an intravenous infusion of dextrose. The results may be briefly summarized as follows: The exudate of pulmonary edema contains dextrose or a reducing substance. The concentration seems to be in general equal to that of the blood. Two hours or longer after an intramuscular injection of adrenalin the exudate of the pulmonary edema may contain 0.5 per cent. and more of dextrose, a quantity, which, at least so far, usually slightly exceeded that of the corresponding blood.

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The effect of culture medium contaminated with the excretion products of Paramæcium on its rate of reproduction.

By **LORANDE LOSS WOODRUFF.**

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A summary is presented of the initial experiments of a series which is planned to elucidate, if possible, some of the complex factors at work in a "hay infusion"; for example, such as those which determine the inter-dependence of the organisms, their sequence, time of appearance, disappearance, etc. The data outlined were derived from the study of: (*a*) the effect of different volumes (2, 5, 20 and 40 drops) of culture medium on the rate of reproduction of *Paramaecium;* (*b*) the effect of changing the culture medium daily and on alternate days on the rate of reproduction of *Paramaecium;* and (*c*) the effect of culture medium, in which large numbers of paramæcia have been living, on the rate of reproduction of *Paramaecium.* It is believed that the results obtained justify the following conclusions:

1. The rate of reproduction of *Paramaceium aurelia* and *Paramaecium caudatum* is influenced by the volume of the culture medium, within the limits tested, and the greater the volume the more rapid is the rate of division.

2. Paramæcia excrete substances which are toxic to themselves when present in their environment, and these substances are more effective when the organisms are confined in limited volumes of culture fluid.

3. The excretion products of paramæcia play an appreciable part in determining the period of maximum numbers, rate of decline, etc., of this animal in "hay infusions."