

It may be inferred that these particles in the protoplasm of *Stemonitis* which, it will be noted, are apparently of colloidal dimensions, are possibly protein in nature and an integral part of the living substance.

It is of considerable theoretical interest to note also that, since particles of similar dimensions have in recent years been observed in the protoplasm of various cells, it is reasonable to assume that the specific behavior of the colloidal particles in this slime-mold may prove to be of general fundamental importance in further study of the colloidal properties of protoplasm.

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#### **Compensatory hypertrophy of the kidney: The effect of pregnancy and of lactation.**

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The stimulus to compensatory hypertrophy was given by the removal of one kidney from a rat. The degree of hypertrophy was measured by comparing the weight of the remaining kidney forty days after the operation with the weight of the kidney of rats in which one kidney had been exposed but not removed. This value is expressed as a percentage. Thus if the weight of one kidney of the control rat was 1000 mg. and the weight of the remaining kidney in the nephrectomised rat was 1300 mg., the degree of compensatory hypertrophy was 30 per cent. The percentages given are the averages of groups of rats. It was intended that there should be 25 rats in each group, but since all of the animals did not become pregnant at the expected time this number was not reached in all of the experiments. The diet used was adequate for growth and for reproduction and contained 17.8 per cent of protein, 24.9 per cent of fat, and 42.2 per cent of carbohydrate. The amount of food taken was nearly the same in all experiments except in the lactation experiment. In this instance the caloric intake rose from 25 calories to 90 calories per 100 grams of body weight per day.

The following results were obtained in rats 180 days of age:

|                                                 | Percentage Hypertrophy |
|-------------------------------------------------|------------------------|
| 1. Non-pregnant -----                           | 23.9 per cent          |
| 2. Pregnant after nephrectomy -----             | 31.7 per cent          |
| 3. Pregnant before nephrectomy -----            | 32.9 per cent          |
| 4. Pregnant and lactating after nephrectomy---- | 34.3 per cent          |

Two experiments were carried out on rats 360 days of age.

|                                    |               |
|------------------------------------|---------------|
| 1. Non-pregnant -----              | 24.7 per cent |
| 2. Pregnant after nephrectomy----- | 28.5 per cent |

Further experiments are now under way which may throw light on the significance of these figures.

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### The effect of training on lactic acid excretion.

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To determine the effect of training on the lactic acid excreted in the urine after exercise, an untrained subject began regular exercise twice a week for two weeks, and then daily for three weeks. The exercise consisted in carrying a 30 pound load on a treadmill with 7 inch steps for 5 minutes at a rate of between 80 and 85 steps per minute. Samples of urine were collected immediately before, and for approximately half an hour after exercise. The rate of lactic acid excretion before exercise was determined, and the subsequent excess above this resting rate was attributed to the exercise. The results of these determinations at various periods during the experiment are given in the accompanying table. It shows a definite decrease in the excess of lactic acid as the experiment proceeded. Subjectively this decrease was accompanied by somewhat less distress during exercise and by less fatigue afterward. This decrease might be explained by assuming an increased mechanical efficiency, so that less lactic acid was formed by muscular contraction; or the decrease might be due to a better oxidative removal of lactic acid because of