nation shows that pollen tubes make their tortuous way between the walls of adjacent cells rather than traversing or penetrating the cell. We should expect, therefore, to find not a cytase or cellose-digesting enzyme, but rather a pectinase, capable of digesting the pectin of the inner lamella. This has been proved in the writer's experiments to be the case.

Twelve kinds of pollen have already been tested, namely, Easter lily, *Lilium rubrum*, red maple, Norway maple, Siberian crab apple, Austrian pine, magnolia, dandelion, goldenrod, ragweed, and corn. Rye, daisy, dock and timothy are now being examined.

The enzymes tested for, both qualitatively and quantitatively, were as follows: amylase, zymase, invertase, erepsin, trypsin, pepsin, lipase, catalase, reductase, cytase, tryosinase, and pectinase.

So far amylase, invertase, catalase, reductase, and pectinase have been found in all. Several of these reactions are so rapid and striking that they make excellent laboratory demonstrations. Erepsin, pepsin, trypsin and lipase were found active in some and not in others. Cytase, and tyrosinase have not yet been satisfactorily identified in any. Zymase has been found so far only in Siberian crab apple.

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Effect of the anesthetization on the subsequent behavior and intelligence of albino rats.

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The behavior of albino rats was studied in Watson's maze.[1] Young adult rats were first trained so as to find their way out of the maze by the shortest distance and in the shortest period of time. After the animals have been thoroughly trained anesthetics were administered and the subsequent behavior after recovery from anesthesia was studied. The effects of a single anes-

[1] Watson, J. B., *Jour. of Animal Behavior*, 1914, IV, 56–59.

thetization and of repeated anesthetizations after several days' intervals of time were noted. The anesthetics studied were nitrous oxide, ether and chloroform. In the different experiments the animals were kept under anesthesia from one to five minutes and observations of their behavior were begun as soon as they were awake and running about.

A difference in the effects of the different anesthetics studied was very early observed. Nitrous oxide, when administered carefully together with sufficient oxygen to prevent asphyxia, produced the least deleterious effects. The animals recovered their normal behavior or intelligence within a few minutes after coming out of anesthesia.

Numerous experiments with ether showed that the rats in this case also were not much affected by the drug. On recovering completely from the anesthesia, about half an hour afterwards, they found their way out of the maze without going astray, but showed occasionally some retardation in the duration of performance. On the following day however the animals were found almost invariably to have recovered completely their intelligence. Even after repeated anesthetizations on different days, or after prolonged single anesthetizations the same results were obtained.

Chloroform was found to be by far the most deleterious anesthetic of those studied. A single administration of the drug for a minute or two was sufficient to impair the intelligence of the animal for that day, and more prolonged anesthesia or repeated anesthetizations produced a greater impairment of intelligence, as manifested by the behavior of the animals in the maze or labyrinth for several days afterwards. In some cases the impairment of the mind and loss of memory were permanent or complete and the animal required to be retrained before it could perform its original tricks. The effect of various opiates on the behavior of rats has been investigated by the authors, and will be reported at an early date.