the usual period, and the crops become less regular; the same effect is brought about during very cloudy and cold summers.

6. The same conditions bring about sterilization of certain of the sexual cells. Thus, patches of cells within the antheridial sori fail to divide. Cells at the margins of female sori remain barren, so that the usually borderless sori acquire partial or even complete borders.

7. There are strong reasons for concluding that the factor which determines the maturation and liberation of the sexual cells, and the fertilization of the oospheres, is the amount of the illumination to which the plants are subjected.

8. The cytology of the reproductive cells will be described as far as it has been made out.

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J. LLOYD WILLIAMS.

CHANGES IN THE GLAND-CELLS OF DROSERA PRODUCED BY VARIOUS FOOD-MATERIALS.—The work is an extension of that previously undertaken by the authoress, an account of which has already appeared in 'Quart. Micro. Journ.,' vol. xxxix.

In the experiments now described, leaves were fed with egg-albumin, globulin, peptone, fibrin, milk, nuclein, nucleic acid, and calcium phosphate, the histological changes in the gland-cells being noted in each case.

The results to be described were obtained with fixing-fluids, widely differing in their chemical constitution.

Egg-albumin. The basophil cytoplasm becomes pink, and is reduced in twenty to thirty hours to a mere vestige. After two days it commences to recuperate, and ultimately becomes again basophil. The changes in the nucleus comprise—(1) those of the nuclear chromosomes, (2) those of the nuclear plasm, and (3) those of the nucleoli. In the resting-cell the nuclear chromatin is scanty, but immediately after feeding it commences to increase, till in twenty to thirty hours large segments are formed as in mitosis. During recuperation the segments again diminish. The eosinophil nucleoli are large in the resting-cell; they diminish after feeding in direct proportion to the increase of the basophil chromatin, and finally enlarge when the chromatin-segments diminish.

Peptone is absorbed much more rapidly than egg-albumin, and produces in one hour changes similar to those effected by egg-albumin in twenty to thirty hours.

Globulin also produces changes in twenty-four hours, but to a less marked degree than egg-albumin. Food passes into the tentacle between the lateral walls of the cells, and secretory products pass through the apical walls, thus producing an appearance of striae in the food which is in contact with the tentacles.

Fibrin is digested slowly, and changes similar to but generally less pronounced than with egg-albumin are seen.

Milk is absorbed rapidly and completely. The morphological changes are less marked than with any of the above-mentioned foods. The cell-plasm remains basophil throughout.

Nuclein produces almost no effect; the tentacles do not bend in, and do not secrete more copiously than before. No cytological changes are produced except very slight vacuolation of the cell-plasm. All the colour reactions are the same as those of controls.

Nucleic acid produced rapid bending in of the tentacles, and extremely copious secretion. The leaves reopen in one to three days, and although the quantity of nucleic acid given is not perceptibly diminished, there are great histological changes, consisting in an almost complete disappearance of the cytoplasm (which remains basophil throughout), and of the nucleoplasm. The basophil chromatin-segments remain unaltered.

Calcium phosphate produces appearances very similar to those after feeding with egg-albumin, but the cytoplasm remains basophil.

Control leaves, after the application of all the above substances, reopened in a perfectly healthy condition, as determined by their naked-eye appearances while living, and their microscopic structure after fixing by different methods.

LILY H. HUIE.

A POTATO-DISEASE.—I have for some time past had occasion to recognize here and there, in various parts of England, a potato-disease which is not due to *Phytophthora*, and which has often been ascribed to bacteria. During the past two years my attention has been especially directed to testing its bacterial origin, and I am convinced that it is not due to bacteria, but to a true hyphomycetous fungus.

Without going so far as to say there is no bacterial disease of the potato, I wish to express the conviction that the alleged cases of such

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