

SUMMARY.

The results of this experiment show conclusively:

That the Bordeaux mixture, properly applied to the plants during their period of growth, does materially lessen the smut.

That the ammoniacal copper carbonate was not as effective as the Bordeaux in preventing the smut.

That frequent applications of the fungicides are necessary during the growing period of the plant in order to be effective.

A NEW STATION FOR *PLEODORINA CALIFORNICA* SHAW. BY SEVERANCE BURRAGE.

During an investigation of the sanitary condition of the Wabash and Erie Canal as it runs through Lafayette, made in the laboratories at Purdue in September of the present year, *Pleodorina* was found in considerable abundance in the canal water. This comparatively new member of the *Volvox* family was first described by Walter R. Shaw, of Leland Stanford University, who found the plant in a ditch in Palo Alto in September, 1893 ("Botanical Gazette," Vol. 19, p. 279). Since then D. M. Mottier has reported it in Bloomington, Indiana, in May, 1894, and Messrs. Clinton and Burrill in Havana, Illinois ("Botanical Gazette," Vol. 19, p. 383), in June of the same year. It is now possible to add another station in Indiana, namely, Lafayette.

The microscopical examinations were made according to the Sedgwick-Rafter method, which has been used for several years by the Massachusetts State Board of Health in the enumeration of microscopical organisms, exclusive of bacteria, in water supplies. The average number of *Pleodorina* in one cubic centimeter of the canal water was four. The census of other organisms found in the same samples included, on the vegetable side, *Hydrodictyon*, *Chara*, and *Spirogyra*, too large and abundant to enumerate; *Diatoms*, per cubic centimeter, eight; *Oscillaria*, fifty-six; *Anabaena*, three; *Scenedesmus*, one; *Protococcus*, eight; *Crenothrix*, ten; *Pandorina*, one; *mold hyphae*, three; and, on the animal side, principally *infusoria*, as *Peridinium*, two hundred and ninety-six; *Monas*, four; *Trachelomonas*, three; *Dinobryon*, three; and a few *Rotifera* and *Acarina*. The water was quite turbid, and had the general appearance of dilute sewage, and in fact the water of the canal was evidently polluted. This shows the nature of the water in which *Pleodorina* seems to flourish in Lafayette, and also many of its companions.

But, aside from the interest attached to this new genus of the *Volvocinae* from the botanical point of view, it may be found to have important relations to odors and tastes in water supplies, when it will become the enemy of engineers and water commissioners, as other members of this group have done before. For example, *Volvox globator* has caused much trouble in Rochester, N. Y., by imparting a disagreeable fishy odor to the city water supply, and in Massachusetts *Pandorina* and *Eudorina* have caused similar troubles on a smaller scale. *Pleodorina*, coming as it does between *Volvox* and *Eudorina* in the classification, may be looked upon with suspicion in this respect, if it ever infects a water supply in a sufficient quantity. On account of the filthy condition of the canal water in which it was found in Lafayette, and the number of other forms growing with it, no idea could be formed as to the nature of the odor, if any, of *Pleodorina*.

FORMS OF XANTHIUM CANADENSE AND X. STRUMARIUM. BY J. C. ARTHUR.

In the absence of the author the outline of the paper was presented by Mr. Wm. Stuart and photographs of the two species were shown. The species in their most typical forms differ widely in the outline of the leaf and character and size of the burs. *X. Canadense* has a flowing sub-entire outline to the leaf, and large, strongly hispid fruit covered thickly with prickles, while *X. strumarium* has dentate leaves and smaller glabrous fruit with fewer prickles. All gradations exist between the two types, due possibly to hybridization.

NOTES ON WOOD SHRINKAGE. BY M. J. GOLDEN.

The increase or diminution in size of a piece of wood, due to its possession of a greater or less amount of moisture, is well known, as is also the fact that this change in size may be accompanied by the expenditure of a great deal of force. If an unseasoned piece of wood has two sides fastened rigidly so that it can not shrink across the grain, and then be exposed to a current of comparatively dry air, it will very soon break, the break being in the direction of the length of the cells of which the wood fibers are composed; or if a piece of dry wood be confined rigidly to prevent any *increase* in size and then be saturated with moisture, it will tend to swell and the force will be sufficient to crush the fibers where they are in contact with whatever confines them.