

hand, the surface tension is negative at the surface of a colloid particle, there will be no flocculation, and the particles will not approach each other near enough to crowd the liquid out of the region of surface energy around either particle. This, of course, does not imply that there is any tendency in the latter case for the colloid particles to remain in equilibrium equally diffused throughout the liquid.

ARTHUR L. KIMBALL

AMHERST COLLEGE

THE WHITE PINE BLISTER RUST; DOES THE FUNGUS WINTER ON THE CURRANT?

In the work carried out in the Province of Ontario during the last two years on this disease, strong suspicions have been aroused that the fungus may in some cases pass the winter on the currants themselves. Several lines of evidence support these suspicions.

1. The commencement of the currant stage each spring here and there over large areas, without any apparent relation to the pines therein.

2. The similar yearly recurrence of the currant rust in one particular district ten miles by four miles in extent. In this area (a) the rust outbreaks do not bear any apparent relation to the pines; (b) the pines are very few in number; (c) many lots of these pines are small and their freedom from disease has been established; (d) the evidence from five lots of these young pines growing close to infected currants indicates that the rust was not introduced into this area until 1914, and that therefore the prevalent currant stage of 1915 and 1916 could not be due to pine blisters, which have not yet had time to mature.

3. The finding of six cases of the currant stage early in the year from one to two miles distant from any possible source of pine infection.

4. The occurrence of currant rust in 1916 on two adjacent plants in a large plantation. Early in the year these two only were rusted. The only four plants which were badly diseased here in 1915 included these two.

5. The occurrence of a rust outbreak on a plot of one hundred black currant plants

which were badly rusted in 1914, and which had been set out in a disease-free neighborhood in the spring of 1915 to test hibernation.

A hypothesis is advanced which gives a reasonable explanation of the suspected hibernation. The rust often causes early defoliation of the currant plants, and this defoliation is followed by a secondary production of foliage, due to the development of winter buds. The general occurrence of the rust on these secondary leaves suggests that, allowing for the two weeks' incubation period, the infection must take place very early in their growth, and the question naturally follows: can such started buds be infected at such an early stage in their development that if winter conditions set in soon after, the buds are still capable of surviving?

W. A. McCUBBIN

DIVISION OF BOTANY,
EXPERIMENTAL FARM SYSTEM,
DOMINION OF CANADA,
November, 1916

PAMPHLET COLLECTIONS

TO THE EDITOR OF SCIENCE: I note in SCIENCE for November 24, an article by Tracy I. Storer from the University of California on "The Care of Pamphlet Collections" in which a type of cardboard case open at the back only and "not larger than $12 \times 8 \times 2\frac{1}{2}$ inches" is recommended for this purpose. Permit me to state that such cases differing only in size—mine are $11 \times 7 \times 3$ inches—have been in use in my department since 1904. Several other departments in the university had such cases made after my design and they have been in rather general use here since. I do not remember whether the idea is original with me or not. These cases are arranged alphabetically by authors and the card index is by subject with the catch word first on the card.

CHAS. B. MORREY

DEPARTMENT OF BACTERIOLOGY,
OHIO STATE UNIVERSITY

INDUSTRIAL LABORATORIES AND SCIENTIFIC INFORMATION

TO THE EDITOR OF SCIENCE: The undersigned committee on engineering of the General Committee on Research, of the American Associa-