figures merely indicates the approximate magnitude of required lens.

It is preferable to use the microscope at the proper tube length for the greatest definition, and this can be done if a rubber ring cut from a piece of rubber hose is placed around the draw tube to prevent telescoping from the weight of the camera. Many modern microscopes have the draw tube fixed at the proper length, so no additional friction is needed.

The use of the vest pocket kodak with the autographic feature allows permanent labeling of the negatives, which can not be done with the box camera. The magnification obtained will depend on the lens on the camera and the distance from the lens to the film. It can be obtained easily by photographing a stage micrometer. When it is desirable to reduce the cost of the negative film an insert can be made to reduce the opening in the back of the camera, cut from the thin aluminum of an ordinary cookie tin, and less expensive moving picture film used. The distance that the film is to be turned ahead between pictures can be noted by extending the opening on the back of the camera to the edge of the film and counting the perforations of the film through a red window as the film is wound. The disadvantage of this method is that the camera must be loaded and unloaded in the dark room or in a changing bag. In the previous work[2] I used an insert with an opening of 1 x 1½″, which is twice the size of the cinema frame and thereby reduced the cost of the negatives to about one cent per exposure.

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A NEW TECHNIQUE FOR OBTAINING OOSPORES OF THE HOP DOWNY MILDEW BY INOCULATING COTYLEDONS

FIELD observations in the Fraser Valley, British Columbia, in 1930, showed that young hop seedlings were badly infected with the hop downy mildew, *Pseudoperonospora Humuli* (Miy. and Tak.) Wilson. Cotyledons and primary leaves were covered with conidiophores bearing conidia.

Following this observation hop seed were gathered from plants of the clusters variety and sown in flats in the laboratory in 1931. As the cotyledons and young primary leaves appeared, they were inoculated by placing on them minute portions of infected leaves obtained from diseased "basal spikes." The seedlings had been previously moistened. The seedlings were afterwards covered with vials so as to maintain maximum humidity. They were grown in the basement of the laboratory, where the temperature remained fairly constant at 58° to 65° F. The seedlings were moistened with water each day.

After a period of six days, the time varying with different seedlings, it was noticed that the cotyledons showed signs of "damping off." Microscopic examination of the cotyledons showed that no conidiophores had developed, but on teasing out the tissue, it was found that oogonia and oospores were present in abundance. Approximately eighty oospores were found in each cotyledon, giving an average of 160 oospores per seedling. The oospore dimensions corresponded with those reported by other workers, ranging between 23 and 37 μ. Further work revealed that when maximum humidity was not maintained, conidiophores bearing conidia were produced, as well as oospores.

At present it is possible to collect abundant oospore material by inoculating hop seedling cotyledons in the manner described and gathering the latter when they show signs of damping off. By this method it will also be possible to obtain conidia for experimental purposes in the greenhouse during the winter period.

The writer considers that this technique of inoculating cotyledons may be applicable to other members of the Phycomycetes, which means a great saving of time for the worker who wishes to examine oospore material within the host.

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SPECIAL ARTICLES

ON THE VARIATION OF THE OXYGEN CONTENT OF CULTURAL SOLUTIONS

EARLIER observations led to the conclusion that there may be a translocation of oxygen from the shoot to the root of plants when the shoot is in sunlight and the root is in soil.[1] The present note records observations, to be published in detail elsewhere, that a similar movement of oxygen may take place when the roots of plants are in cultural solutions, particularly in distilled water.

The plants referred to are willow, cotton, corn and sunflower. These were grown in a standard culture solution and were transferred to distilled water for

[1] W. A. Cannon, "Studies on Roots," Carnegie Institution of Washington. Year Book No. 25, p. 317, 1925–26.

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