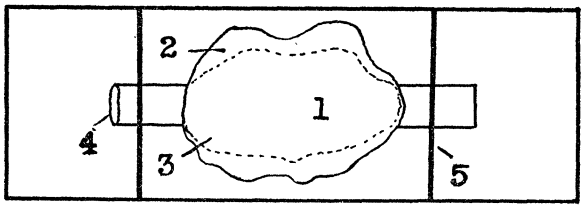
A SIMPLE METHOD FOR THE STUDY OF LIVING FRESH-WATER SPONGES

THE pores, oscula and superficial canals of fresh-water sponges can be readily seen with the aid of a good lens. The many branching canals which extend throughout the sponge body, the flagellated chambers and the cellular structure, however, can not be easily studied on the living sponge. All these structures may be demonstrated by a very simple method.

If a small healthy sponge or a portion of a larger one is placed on a glass slide at the bottom of a dish of pond water (water 2 to 3 inches deep) it will soon adhere to the slide and grow out on the surface of the glass as a thin incrustation. If the sponge used is growing on the stem or leaf of a water plant it will tend to float. In this case the stem (4) or leaf should be tied to the glass slide by



pieces of thread (5), as shown in the diagram. The slide should be changed to fresh pond water every twenty-four hours. Generally a thin marginal membrane, attached to the slide around the sponge mass, appears within twenty-four hours. By the end of the second day a wide area (2, 3) of sponge tissue has grown from the original mass, and by the end of the third day large canals are easily seen in this area without the aid of a lens. If the sponge used is small, all the tissue deserts its original substratum and moves out on the slide. If the original sponge is large the thick portion (1) may be carefully cut away without injury to the encrusting mass. The slide may then be taken from the dish, covered with a thin cover glass, and studied with the oil immersion objective if necessary. At the periphery of the mass there is a thin marginal membrane (2) in which the various types of amoeboid cells may be more easily studied. The inclusions of these cells are more clearly seen if a very dilute solution (1–10,000) of some vital stain such as Nile blue or methylene blue is added. In the thicker part of the incrustation (3) the flagellated chambers, with the actively beating flagella are seen. These preparations may be studied for long periods, provided water is added at the edge of the cover glass quite often. The cover may be removed without injury to the sponge and the slide returned to the pond water for future study, or the specimen may be fixed on the slide and a permanent stained mount prepared.

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SPECIAL ARTICLES

INSECTS AS VECTORS OF YELLOW DWARF OF ONIONS[1]

FOR the past few years onion growers in the vicinity of Pleasant Valley, Iowa, have been greatly concerned over a virus disease of the onion, known locally as "yellow dwarf," and the means by which it is disseminated under field conditions. During the season of 1928 losses from this malady amounted to as high as 95 per cent. of the crop in some plantings. At that time field observations made it quite evident that some agent, perhaps an insect, was responsible for the spread of the disease. Since 1928 yellow dwarf has not been so prevalent in the fields nor so severe in its attack, a result largely due to the practice of using only disease-free sets. Such sets were secured either from localities where yellow dwarf had never appeared or from fields within the infected area free or almost free of the disease as determined by indexing. During this period, however, it remained constantly evident that there was dissemination in the field by vectors.

While making a survey of the insect pests attacking onions in Iowa the writers, aside from studying the forms that might be called of primary and secondary importance, have given attention to several species which are not able normally to subsist on onion, but which, nevertheless, occasionally or only incidentally feed upon it. Although many tests have been made with members of the former groups it has from the first seemed probable that in the latter would be found the vectors of the virus.

Yellow dwarf, or "crinkles" as it is sometimes called, is so named because of its most characteristic symptoms—*viz.*, yellowing and stunting of the plant, accompanied by drooping and frequently by crinkling and chlorosis of the leaves. Under certain conditions the symptoms may be completely masked until after the bulbs have undergone a rest period and then have been regrown. Such plants may serve as a means of carrying the disease from season to season and as a

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