urally, cracks in the crust will follow the sags of the ground surface. This automatic register of the movement of the earth-wave indicates a course at right angles to the directions given, namely, N.E. to S.W.

The direction of these crust cracks has been verified, since the above was written, by observations made by lumbermen 40 miles inland from Gaspé.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A METHOD OF DEMONSTRATING ACIDITY OF FOOD VACUOLES IN PARAMECIUM

WHILE searching for certain intravitem stains the present writers observed that acidity in the food vacuoles of Paramecium caudatum could very easily be demonstrated in the following manner:

Common red cabbage leaves with the stems cut out were boiled in a minimum of water. There thus was obtained a very dark reddish purple solution which became red in the presence of acids and green in the presence of alkalies. This solution was filtered and a few drops added to a small culture of the infusorian. Within ten minutes the animals had taken enough of the colored fluid and the small particles therein into their bodies to make their food vacuoles very distinct. Under these conditions the food vacuoles appeared distinctly red in color, thus showing the presence of acid in the vacuoles.

This appealed to us as a good simple method for classroom or laboratory demonstration.

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MICRO SLIDE RINGS

MICRO slide rings of any size desired can be cut from sheet celluloid by means of hollow punches. These rings are affixed to slides by dipping them in liquid nitrocellulose made by dissolving celluloid in amyl acetate and pressing them down on the slides by means of forceps. When dry, they are permanently attached to the slides, are not soluble in xylol and are excellent for mounting thick objects such as tapeworm proglottids in balsam. Ringing with gold size completes the mount.

Those who have found glass rings unsuitable, who have experienced difficulty in securing fiber or hard rubber rings and who have known the annoyance caused by the hard rubber rings breaking after the mounts are made, will find that this method will solve their problems.

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SPECIAL ARTICLES

THE EFFECT OF POLARIZED LIGHT ON THE GROWTH OF LUMINOUS BACTERIA

THAT polarized light does have a marked effect on biological phenomena was pointed out for the first time by Miss E. S. Semmens.[1] Shortly after her paper was published, E. G. Bryant,[2] working in South Africa, published a paper on the biochemical effect of polarized light and its relation to some of the superstitions of the natives of his part of the country. Although the presence of sufficient polarized light in moonlight to have any effect on the majority of biological processes is at present disputed by some workers in this field (*cf.* H. M. Fox, Proc. Roy. Soc., B, 95, 523, 1923), Mr. Bryant found that pieces of fish which had been placed in bright moonlight became highly putrid during the course of a night's exposure, while control pieces of the same fish kept in the dark remained comparatively fresh over the same period of time. He offers no explanation for this phenomenon, pointing out merely that the taboo against eating fish which had been exposed to moonlight had a fairly sound basis.

During the course of some work on luminous bacteria, it occurred to me to study the effect of polarized light on the growth and luminescence of these forms. The type used was Photobacterium phosphorescens, isolated from fish obtained at the Princeton fish market in the fall of 1923, and used in this laboratory for various experiments.

Two Petri dishes were planted with these bacteria and one was placed under light which had passed through a Nicol prism, while the other was kept in the dark. At the end of eight hours it was found that the one which had been in the polarized light had reached its maximum intensity, but the one in the dark was just beginning to glow. Likewise, it was found that the first plate had become almost dark at the end of fourteen hours, while the second had just reached its maximum intensity. The normal length of time for a culture to reach its maximum of luminescence and decrease again is about twenty-four hours, and the second plate followed this natural growth rate.

Later experiments were carried out in a more rigorous manner. A Petri dish of agar was inoculated with as uniform a culture of bacteria as it was possible to obtain over the surface of the plate. Two rings of sterile ebonite were then pushed into the agar and the cover of the dish brought down tightly upon them. On top of the plate were placed two ebonite rings of the same diameter as those inside of the dish and directly above them, and the rest of

[1] Semmens, E. S., *Nature*, Vol. III, 49, 1923.

[2] Baly, E. C. C., and Semmens, E. S., Proc. Roy. Soc., pp. 681, 1923.