small *x*. Like *ampere, angstrom* is spelt with a small *a* and without diacritical mark, but the symbol is *A*. The spelling *disk* is adopted as being more English, and *diaphram* is advocated, and also the use of a hyphen between vowels in such words as *photo-electric*. However, the spellings *tho* and *thru* are considered too different from the accepted forms and too distracting to the reader. We make no claim to consistency; in fact this is foreign to the spirit of the English language. In each case we try to adopt the form which is simpler, clearer and less distracting to most readers; but we can not hope to suit every one. Many will think we go too far, while others will accuse us of being too conservative.

This service to authors and readers requires much careful work, but we hope it is worth the time and effort expended.

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THE FRESH-WATER SPONGE, SPONGILLA LACUSTRIS LINN., IN MASSACHUSETTS

DURING the late summer of 1924 there was found in the Sudbury River, near the village of Concord, Massachusetts, great masses of the fresh-water sponge, Spongilla, growing from a muddy bottom. The occurrence of such large masses of fresh-water sponges is not common, and since this species has not been described from Massachusetts, it seemed desirable to record it.

As one looked into the water the whole river bottom appeared to be covered with many green stalagmitic growths. Upon closer examination, these growths proved to be sponges, averaging about 15 cm in height, the largest reaching a height of about 30 cm. The sponges showed profuse branches of varying diameter tapering at the distal ends. The branching could almost be described as dichotomous. The average diameter of the main stalk was about 8 mm, varying from 3 mm in the shortest specimens to 12 mm in the longest ones. Each stalk was fixed to some river weed, particularly to the fresh-water eel grass, Vallisneria spiralis L., of which there was an abundance. The intense green color of the sponges was found to be caused by the presence of large numbers of green algae living epizoically. By far the greater number of these algae belong to the Protococcales, although there were many diatoms.

The river bottom is extremely muddy, making it impossible to collect the sponges by wading. The current has a low velocity so that the water is clear. The depth of the river at mid-channel varies from 2.5 to 3 meters in the spring, to about 1 meter in late summer. The animals near the banks at this latter season may be bent over horizontally parallel with the surface of the river, while in some cases the water may have receded sufficiently to expose entire colonies.

From the manner of growth and of branching, from the size and appearance of the skeletal and dermal spicules, the species was tentatively identified as Spongilla lacustris Linn. Measurement of 100 skeletal spicules, including all lengths, showed an average length of 0.300 mm (a slightly larger figure than that reported by Potts[1]) and an average diameter of 0.012 mm; while the dermal spicules, exhibiting much less variation, showed an average length of 0.047 mm and an average diameter of 0.0029 mm. The mode for length of skeletal spicule was 0.315 mm, the maximum and minimum lengths being 0.355 mm and 0.285 mm, respectively. It is also to be noted that instead of the swiftly running water habitat, usually reported for this species, these specimens were attached to a deep mud bottom in a slowly moving stream and were supported by water plants.

The approximate location of this habitat is an area of about 280 square meters extending along the bottom of the Sudbury River nearly half way between Nashawtic (Echo) Bridge and the railroad bridge of the Boston and Maine, Southern Division, at Concord, Massachusetts.

Although search was made from August up to the middle of December (long after several severe frosts, and once after the river had been frozen over), no gemmules have been found, preventing a positive identification of the species. Professor Frank Smith, however, who has examined formaldehyde specimens, reports the same tentative identification as given above.

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A NATURAL SEISMOGRAPH

A FEW days before the earthquake of February 28th there was rain over the snow-covered fields of Gaspé. This froze into a hard crust. The morning after the earth tremor this crust over the snow fields was found to be cracked in long parallel lines running N.W. to S.E., a little E. This observation is reported to me by Mr. F. J. Richmond, of Gaspé, a close observer, who adds that when snow settles nat-

[1] Edw. Potts. Contributions towards a synopsis of the American forms of fresh-water sponges with descriptions of those named by other authors and from all parts of the world. *Proc. Acad. Nat. Sci.*, Philadelphia, 1887.

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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THE JOHNS HOPKINS UNIVERSITY

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.