Letters to the Editor.

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The Action of Sunlight.

REFERRING to Dr. Saleeby's letter in NATURE of December 8, p. 466, I may report that, in conjunction with the late Marshall Ward, professor of botany at Cooper's Hill, I carried out a number of experiments at Liverpool near the end of last century on the effect of light in slaughtering anthrax bacilli. Prof. Ward prepared the cultures, covered them seriatim with a quartz plate which I lent him, and then sent them to me to be exposed to a suitably arranged arc light through quartz lenses and a quartz prism, discriminating the kind of light by its effect on fluorescent paper pasted at the side. The experiments were never properly published, though they are partly described in Prof. Ward's memoir on the subject in the Phil. Trans. Unfortunately, I do not possess the B series to refer to, but Dr. Saleeby could easily find the paper, and I think it would interest him.

The general outcome, to my mind, was that the arc light was more efficient than Liverpool sunlight, but that the most effective parts of the spectrum were two strongly phosphorescing bands in the ultra-violet, not far from the visible portion, and not of such short wave-length that clean air would be opaque to them. Their wave-lengths were, in fact, about 3830 and 3250 tenth-metres.

The unpolluted atmosphere seems well adapted to screen us from the really deleterious rays of exceedingly short wave-length, while still allowing the microbe-destroying rays to come through and do their beneficent work. OLIVER LODGE.

Microscope Illumination and Fatigue.

IT is interesting to note from Mr. J. E. Barnard's letter in NATURE of December 8, p. 468, that other workers have taken up the problem of variable illumination for the microscope. But in criticising the method outlined in these columns on November 17 Mr. Barnard seems to have overlooked the important fact that a monochromatic light-filter is used, so that the question created by the shift of the dominant radiation does not arise. This shift—which in its simplest expression amounts to a reddening of the light as the temperature of the source is decreased—was fully recognised when the method of regulation was originated, and in practice is a distinct advantage, since the apparent decrease of illumination of the field, when a filter is used which passes only a small band of the spectrum, is greater than that of the light source alone, where the full spectrum is present. Hence any increase of the resistance of the circuit doubly decreases the light in the field.

The neutral wedge device described by Mr. Barnard is very ingenious, and if it can be controlled from the front of the working bench by a long actuating spindle should be of the greatest use when monochromatic light is not desired. It is not easy to put an arm round to the front of the microscope to make an adjustment without moving the eye from the eyepiece, especially when a drawing-table and other accessories are in use. The adjustable resistance can, of course, be put wherever it is most convenient to the hand, and its use in a short time becomes almost subconscious.

It would be of interest to know whether in Mr. Barnard's experience he finds that there is any increased visibility of the finer details when variable illumination is used. This is markedly the case in cytological preparations and in the examination of cotton hairs.

The use of monochromatic light, so strongly advocated by Dr. Spitta, raises several questions, and is open to criticism where double staining methods are used, though with two filters all details can usually be made out. There was a half-promise in Zeiss's 1913 catalogue of monochromat objectives. These were put on the market some years before the war, corrected for monochromatic ultra-violet light, and an admirable description of their use was given by Mr. Barnard in NATURE of November 28, 1920, but there would be a real use for monochromats for visible light of a definite short wave-length if the attention now given to apochromatism could be transferred to flatness of field. H. J. DENHAM.

Shirley Institute, Didsbury, Manchester,
December 9.

Tin Plague and Scott's Antarctic Expedition.

IT will be recalled that a chief contributing cause of the failure of Scott's party to get back to their base was the "leakage" of the fuel oil that was stored in tin cans at the depôts along the line of the return march from the Pole. The oil-cans as found were apparently intact and "without hole of any kind," and it was therefore thought by some that the oil had evaporated through the "stoppers." Scott himself, however, wrote in his last message: "We should have got through in spite of the weather but for . . . and a shortage of fuel in our depôts, for which I cannot account, and . . ."

Now it has been clearly understood since 1899, by reason, chiefly, of the continued investigations of the Dutch chemist, Prof. Ernst Cohen, and his collaborators, that ordinary tenacious white tin is no longer stable below 18° C., but may change into a modification that appears grey and pulverulent. This change, long since observed in organ-pipes and other articles in very cold climates, is referred to by Prof. Cohen as tin plague, and spreads fastest, according to him, at about −50° C. Ever since reading Scott's diary in 1913 the present writer has in his teaching been in the habit of suggesting that certain of Scott's paraffin cans contracted tin disease, thus exposing the underlying iron, in spots at least, to the danger of chemical action and so of becoming "pin-holed," with the possible aid of electrolytes present in traces from the process of refining the oil. This rather obvious suggestion has, however, not appeared in your columns, nor was it known to Prof. Cohen, who was lecturing here a few days ago, as he has lectured elsewhere in this country and in Europe, on tin plague and related matters. It was interesting to learn from Prof. Cohen that he had experience of precisely the same phenomenon in the case of canned foods stored at rather low temperatures.

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November 25.

The Dispersal of Snails by Birds.

I WAS present at a meeting of the Malacological Society last May when Dr. Boycott read a very interesting paper, in which he showed how the small snail *Balea perversa* occurred on trees, walls, and rocks, but not on the ground. The question arose