in this country. Non-migratory species, however, are always with us, and must be fought by the farmers in some region or another almost every year.

Americans, however, must not be too sure that, even after much more than half a century breathing spell, our northwest territory may not again be devastated by the old "Colorado grasshopper," as it was called in the seventies. Uvarov and other entomologists have shown that that insect is simply a long-winged phase of a common and always present grasshopper known as *Melanoplus atlanis,* a conclusion suggested as early as 1886 by Scudder. Uvarov, in fact, quotes approvingly the following statement by Hebbard (1910): "When it will again burst forth to devastate not only counties but even states, is purely a matter of conjecture." Uvarov is not satisfied with the general statement made in this country that by the advance of civilization into the breeding-grounds of this species its possibilities for harm have been made to vanish. What were the ecological changes brought about by this advance of civilization? And why should they have stopped this occasional enormous breeding of the long-winged phase? This very question shows pointedly the author's mental attitude towards these great problems.

The book is a remarkable compendium, brought together by a deep student and broad thinker, and it is prepared in such a way that a mastery of its contents will prepare officials considering locust plagues in any part of the world to begin their work in a sensible and competent way. I predict that it will soon be found in the hands of such persons the world over.

We must be grateful to Mr. Uvarov for this result of his long work. And its publication in this fine form by the Imperial Bureau of Entomology places the rest of the world under added obligations to that admirable institution.

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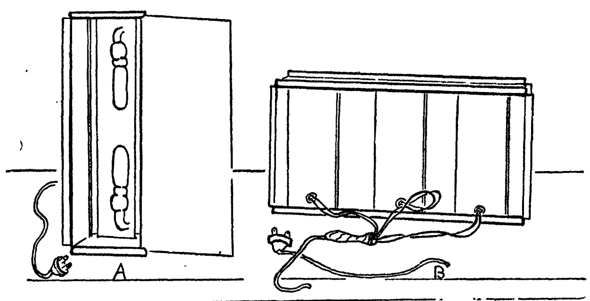
SCIENTIFIC APPARATUS AND LABORATORY METHODS

ILLUMINATION OF ANATOMICAL PREPARATIONS

THESE lighting boxes were designed to illuminate transparent specimens cleared in glycerine solution or in wintergreen oil. They are placed directly behind the specimen so that the light will pass through the thickest part of the preparation and show details otherwise impossible to see. They have been used to demonstrate a variety of semi-transparent preparations, such as sections of tissues and organs, injected blood-vessels, translucent animals and lantern slides. They are simply and cheaply made and are adapted to museum case exhibits or to demonstrations in the laboratory and lecture room, being easy to carry about and to attach wherever electric outlets are within reasonable distance. They are especially efficient in the corridors to classrooms and near elevator entrances, regions where there is usually little competition from daylight but much coming and going by those who may happen to be interested in the exhibits displayed. In such places right lighting and labeling may do a good deal of wayside teaching.

These boxes are made of thin sheet iron, ground glass and strips of half-inch asbestos board upon which miniature Mazda lamps are mounted. The accompanying figure shows one box in front view with the ground glass slipped to one side to display the lamps within (A), and another in back view with its attachment cord shown cut, because of its length, which for general use should be given a generous allowance. The boxes are similarly made; the two sizes shown have been found convenient for a variety of specimens.



Diagrams of front (A) and back (B) views of boxes for illuminating anatomical preparations.

The box at the left measures five by thirteen inches and is four and a quarter inches deep. It is most convenient for lighting tall narrow specimens, but it may be turned over on its side for use with those which are broad and flat. The sides and ends are made of sheet iron. The front edge of the sheet iron is bent into an open fold at the top, bottom and one side. On the opposite side the front edge is simply turned back flat and cut off so that the ground glass may be slipped into the grooves made by the folds at the top and bottom (A). At the back the iron is similarly bent into an open fold at the top, bottom and one side, with a simple flat turn on the edge opposite, but here the folds are made wide enough to allow the half-inch asbestos board to slip into the grooves thus formed. The board fits closely to the top and bottom but a considerable space on either side of it allows the air to circulate and prevents overheating. The asbestos is perforated for wiring, then slipped into place and the lamps are mounted upon it with the cords carried out behind as indicated.

The box shown in back view at the right (B) is made like the other except that in it there are three strips of asbestos with open spaces between them. Each strip is three inches wide and has one lamp mounted at the center of it. Several specimens may be lighted at one time by this box or six to eight lantern slides may be shown. A cheap support for the lantern slides can be made from a sheet of galvanized tin of the same size as the front of the box. When the windows are cut in this the tin at their upper and lower edges is folded back so as to make a groove. Above and below the openings in these grooves the slides may be moved and held in place. When finished the upper edge of the sheet is clipped to the top of the box for support. Exhibits intended to be at all permanent are improved by masks which conceal the extraneous accessories and extra light. Such masks are made of medium-weight black paper in which openings are easily cut. The paper is then lightly pasted to a sheet of window-glass a little larger than the front of the box against which it is supported. Labels receive light enough to be easily read if they are placed flat on the table in front of the openings in the mask.

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CONTROLLING DAMPING-OFF WITH ELECTRIC LAMPS

THOSE who have had difficulty in growing seedlings because of the damping-off fungus during dull, moist weather may be interested in a simple method that has given complete control on pure lines of cucumber seedlings which are very susceptible to the fungus. Pure lines which have been weakened by selfing are slow to germinate during the autumn and winter months because the soil does not receive the sun's heat as it does during the summer. Also, old seed will not germinate well unless optimum conditions are supplied. Second generation seedlings which segregate for certain characters are worthless if damping-off takes the weaker ones.

Previously the soil has been sterilized by chemicals or heat, with varying degrees of success. Where seedlings are germinated every month this method becomes laborious, and considerable time must elapse before the seed can be planted. The sterilized soil becomes infested in a short time so that not more than two lots of seedlings can be grown for each sterilization.

A method has been in use whereby seed is germinated under 200-watt Mazda lamps suspended two feet above the seedlings. A dome reflector concentrates the light and heat so that two hundred seedlings can be grown under one lamp. A mixture of half sand and garden soil is used because it affords good drainage and reduces nitrification. This soil, without the lamps, controls the damping-off if sunlight is not reduced too much and the air does not remain too moist, but the lamps are needed after autumn begins. The seedlings become spindly if a rich garden soil is used.

The lamps are lighted as soon as the seed is planted and are not turned off except on bright sunny days. After the cotyledons have unfolded, the lights may be discontinued if the weather is bright and the surface soil is kept dry. It is preferable, however, to use the lamps until the seedlings are transplanted. With unfavorable growing conditions the potted plants may be exposed to the lamps several hours in the evening until the plants are large enough so that there is no further danger of damping-off.

The lamps have been used to advantage on selections that produce only pistillate flowers during the winter months. These selections may be selfed if the potted seedlings are exposed to the electric light until four or five true leaves are formed. Sufficient staminate flowers will be produced so that the first few pistillate flowers may be self-pollinated. An extra generation can thus be grown for those characters that are not influenced by environment.

Corn and lettuce grown by this method produce sufficient seed for an extra generation. The method has considerable application in northern latitudes where only the vegetative stage of adapted greenhouse plants can be grown during the winter months.

The advantages of the lamps, in addition to controlling damping-off, are that the soil is warmed so that weak or old seed germinates better in a shorter time, and the germinating can be done in a cool greenhouse without increasing the temperature of the greenhouse.

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SPECIAL ARTICLES

CINEMATOGRAPHS OF LIVING DEVELOPING RABBIT-EGGS[1]

RABBITS' eggs of definite ages after mating, $21^2/_3$, 22, $23\frac{1}{2}$, 67, 69 and 71 hours, were washed from

[1] The rabbits for these experiments were supplied by Professor W. E. Castle, of Harvard University.