Credit is given where it is due with discernment in the proper places and is documented by an extensive and detailed bibliography.

That bone is formed through a metaplasia of connective tissue is demonstrated, and the fundamental similarity of the process in all conditions both normal and pathological is emphasized. It is with bone as a skeletal material determining the architecture of the body that the book deals, though appropriate and necessarily brief reference is made to its rôle as a calcium reservoir and as a site for blood formation. Ossification and resorption are considered in detail. A whole chapter, which should prove enlightening to the medical profession, is devoted to the periosteum. Chapters VII and VIII on the repair of fractures and on bone transplantations also supply information of great practical value. The illustrations are few in number but well chosen, for each one of them makes a certain point clear which would otherwise have required pages of text.

To the human biologist it is the last chapter which will prove of all the most stimulating. In it will be found a conservative statement of just how far the misshapen human skeleton can be corrected by the purposeful control of bone resorption and bone formation. A partial answer, in the affirmative, is given to the question "Can one model new ossifications?" because therein lies our hope of constructively recasting the bodies of the many unfortunates in our midst. The book looks to the future, and the translation with its accurate rendering of the complex shades of meaning of the French original makes the presentation available to what I believe will be a much larger group of interested readers.

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Locusts and Grasshoppers: a Handbook for their Study and Control. By B. P. UVAROV, London, The Imperial Bureau of Entomology (1928), royal octavo +, xiii + 352, 118 text illustrations, 8 plates.

THE original edition of this important book was published in the Russian language at Moscow by the Central Cotton Committee in 1927; but this English edition differs essentially, and is much fuller and of much broader interest. It has, in fact, been made not only available but adaptable to all parts of the world, and of course this has necessitated the addition of whole chapters.

The author, already a man of sound training and a well-known student of the Orthoptera, has since the war been connected with the Imperial Bureau of Entomology in London, where, as one of the collaborators on the *Review of Applied Entomology,* he has gained a close acquaintance with the world literature on the subject, and is thus well fitted to put out an authoritative book.

The locust or grasshopper problem has been the despair of many nations, and has undoubtedly in earlier days influenced the trend of civilization. Famine, resulting from crop devastations by locusts, is commonplace in the annals of many countries. Writings about locusts surpass in bulk those about any other group of insects. Man's struggles against them have largely failed in spite of his desperate attempts to save at least a portion of his crops. The fight has been so long and so continuous that at last we are beginning to view the problem in its broader aspects, and it is in its consideration of these broader aspects that this book has its very especial value. In our knowledge of the broad factors of the ecology of migratory locusts there are many gaps, and Uvarov is insistent in pointing out not only what is known but what is still unknown and must be studied by prepared minds.

The book is very comprehensive, including chapters on external morphology, anatomy and physiology, development and transformations, behavior, ecology and distribution, natural enemies, periodicity of mass outbreaks, technique of control and organization of control. To these chapters is added a special part in which the particularly celebrated locusts of the different parts of the world are considered. The chapters of this special part take up the especial locust and grasshopper problems of Europe, Asia, Africa, South, Central and North America and Australia.

American entomologists have been led to a general belief that to the English all short-horned grasshoppers (Acridiidae) are "locusts," whereas we have called them all "grasshoppers," reserving the name *locusts* to the Locustidae, or "long-horned grasshoppers." And the terminology here has been further complicated by the so-called "seventeen-year locust"—a misnomer started by our Puritan ancestors. Of course, this insect does not even belong to the same order. Mr. Uvarov's decision, therefore, to reserve the term *locust* to the migratory Acridiidae, and the term *grasshopper* to the non-migratory species of this family, is novel, but is all right if every one adopts it.

The frontispiece is an outline map on which the locust and grasshopper areas of the world are marked. The author is obviously mistaken in showing a large part of the United States as "subject to regular plagues of locusts and grasshoppers" and the rest of the country as "invaded occasionally." It is more than half a century since any migratory grasshopper or "locust" has done the slightest damage to crops

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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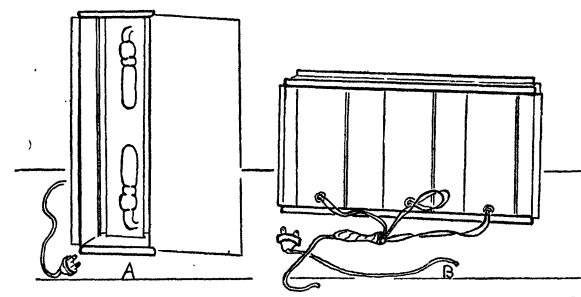
SCIENTIFIC APPARATUS AND LABORATORY METHODS

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