(dull, dirty blue, contrasted with the clearer blue of the cytoplasmic granules) with Delafield's haematoxylin in *Protoopalina,* is no sufficient indication of renal function of the vacuole system and its granules. These granules may, of course, be merely degenerate and not at all specialized for renal function. Experimentation with chemical indicators and the micropipette upon the contractile vacuole contents in *Amoeba,* some large ciliate, like *Paramecium,* and upon *Protoopalina* (with its peculiarly behaving granules) should be of interest.

MAYNARD M. METCALF
JOHNS HOPKINS UNIVERSITY

DIGESTION OF WOOD BY THE SHIPWORM

WHETHER the marine wood-boring mollusks of the family Teredinidae, commonly known as shipworms, bore in submerged timber for protection only, or also for the purpose of utilizing the wood as food, has been a subject of considerable debate. It has been shown by Dore and Miller[1] that about 80 per cent. of the cellulose, and from 15 to 56 per cent. of the hemicelluloses, in Douglas fir piling disappear from the wood during its passage through the digestive tract of *Teredo navalis.* The conclusion was drawn that the carbohydrates which disappear are utilized by the organism as food. This conclusion has lately been substantiated by a different method, in the case of another species of a related genus.

A number of specimens of the Northwest shipworm (*Bankia setacea* Tryon), from one to two feet in length, were removed from samples of Douglas fir timber submerged about one year at the Puget Sound Biological Station. On dissection, a sufficient quantity of wood-borings was obtained from the caeca of these organisms to test for reducing sugars. A similar test was made on a pulverized sample of the original wood. The reducing sugars were determined as glucose by the Benedict-Osterberg method, as modified by Thomas and Dutcher.[2] The following results were obtained:

Reducing sugars (as glucose) in original wood	0.92 per cent.
Reducing sugars (as glucose) in wood from caecum	3.86 per cent.

The amount of reducing sugars in the wood from the caecum is thus about four times as great as the amount found in the original wood. The data are not of quantitative significance in indicating the total amount of sugar formed, as the wood in the caecum is presumably still in process of digestion, while on the other hand a certain amount of sugar has doubtless already been lost by absorption through the walls and typhlosole of the caecum. The results do, however, indicate a decided increase in the quantity of reducing sugars while the wood is in the digestive tract, which is the logical reciprocal of the disappearance of the more stable carbohydrates that was noted in the case of wood-borings which had passed through the digestive tract of *Teredo navalis.*

Thus there is evidence of the digestion of wood in a representative species of each of the two principal genera of shipworms, and it is probably a justifiable assumption that carbohydrates from the wood play an important rôle in the nutrition of this interesting group of lamellibranchs.

ROBERT C. MILLER
LYMAN C. BOYNTON
UNIVERSITY OF WASHINGTON

[1] Univ. Calif. Publ. Zool., *22,* 383–400. 1923.
[2] *Jour. Amer. Chem. Soc., 46,* 1662–69. 1924.

WOODPECKERS AND THE AUTOMOBILE

I HAVE read with interest the letter of Henry L. Baldwin in regard to woodpeckers and the automobile (SCIENCE, April 2, 1926, p. 358), and am inclined to agree with much that he says. I have reason, however, to object to the following statement, contained in the letter: "The red-headed woodpecker is practically non-existent in this region, having been seen in northern New York only once by the writer, and that many years ago." I do not question the validity of his observations: but his apparent reliance upon his own notes as the sole source of information is open to criticism. In this region, which is certainly a part of northern New York, a number of records of the red-headed woodpecker have been obtained during the past four years: cursory examination of my notes shows records for this species on April 7 and 21, 1923, and on March 8, 1925. These records were all taken within ten miles of this place. Although they can not be taken as an indication of distribution outside of this limited area or of particular abundance, they certainly show that the species is somewhat far from non-existent.

FREEMAN F. BURR
ST. LAWRENCE UNIVERSITY

ANNUAL EXHIBITION OF THE ROYAL PHOTOGRAPHY SOCIETY

THE Royal Photographic Society of Great Britain are holding their seventy-first annual exhibition in September and October of this year. This is the most representative exhibition of photographic work in the world, and the section sent by American scientific men heretofore has sufficiently demonstrated the place held by this country in applied photography. It is very desirable that American scientific photography should

be equally well represented in 1926, and, in order to enable this to be done with as little difficulty as possible, I have arranged again to collect and forward American work intended for the scientific section.

This work should consist of prints showing the use of photography for scientific purposes and its application to spectroscopy, astronomy, radiography, biology, etc. Photographs should reach me not later than Saturday, June 12th. They should be mounted but not framed. There are no fees.

I should be glad if any worker who is able to send photographs will communicate with me as soon as possible so that I may arrange for the receiving and entry of the exhibit.

A. J. NEWTON

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

REQUEST FOR DATA ON THE TWILIGHT SONG OF THE WOOD PEWEE

THE wood pewee, one of the commonest birds of the eastern United States and Canada, sings a long, complex musical composition known as the twilight song. It is named "twilight song" because it is sung regularly at dawn, rarely at sunset, and never at any other time of day. The song lasts continuously for a very long time, even as long as forty minutes; but it contains only three different phrases, which I shall speak of as phrases 1, 2 and 3, and which are readily distinguishable from each other, thus affording a basis of exact analysis. A brief, preliminary description of the song can be found in the current (April) number of *The Auk*. Although there are only three different phrases, their order of succession is remarkably complex, and individual variations are so great that apparently each individual wood pewee sings a composition of his own. A thorough study of these compositions will be sure to yield results of great interest. I request that scientists and also non-scientific persons (if only they are accurate) will make records of the song for me. To make the record, you simply write the number of each phrase, 1, 2 or 3, as the case may be, while the bird is singing. This can be done by any person who is careful and reliable and has a sufficiently good ear to follow a tune. The only difficulty is that you need to rise and go out before daylight on one of the long days of early summer, in order to get a complete record. Few persons have the time to spare and the necessary interest and enthusiasm to do this. If you can take the time to make one complete record, it will be a valuable contribution. Please write to the undersigned for a copy of the directions for making a record.

WALLACE CRAIG

HARVARD MEDICAL SCHOOL,
BOSTON, MASS.

SCIENTIFIC BOOKS

Manual of Injurious Insects. By GLENN W. HERRICK. New York, Henry Holt & Co., 1925, 474 pp., 458 illustrations.

ONE of the reasons why entomologists until comparatively recent years were so numerous in Europe and so scarce in America was the lack of books over here which would enable collectors to identify species. The lack of this kind of books still exists, although to a much lesser degree, in the United States. But during the past dozen years a number of good books have been published in this country on the subject of applied entomology, and of these books Professor Herrick's volume is the latest and in many respects the best. It is worthy of note that most of these books have been written by teachers, and their aim has been not only to tell everybody about injurious insects and how to combat them but to place before students a compendium of economic entomology in this country down to the date of writing. I have never taught applied entomology, but it seems to me that, if I were to try to teach, this book would be the one I should use before any as yet published.

Herrick's volume must be praised very highly. It has many good points. The illustrations are competent, and the majority of them are new. And the author has introduced several new features which are excellent. For example, wherever possible he has introduced with the consideration of each one of the principal crop pests a small outline map of the United States indicating the geographic distribution of the insect. It has not been possible to do this in all cases, on account of lack of records, but where it has been possible it can not fail to be of very great use. It shows at a glance conditions which it would take many lines of print to describe.

Another point which makes the book very useful is the introduction of synopses of the chief insects affecting the different crops. For example, after the consideration of insects injurious to apple, there is a synopsis of the chief insects injurious to this fruit in the United States, arranged according to the character of their work as well as to their general appearance in all stages; and this is done in popular language so that the apple grower will be able to find out immediately just what insect is damaging his trees, and he can do it without sending specimens to some distant economic entomologist.

Then too, Herrick has been careful to indicate in his legends to the illustrations the actual size of the insect, an important point neglected by some recent popular writers on insects, thus causing serious misconceptions. His proofreaders, unfortunately, overlooked this in a few instances, as in the case of the