be able to differentiate one class from the other without consulting the original sources.

The catalogue is a work which deserves the highest praise. It is compiled by the foremost double star observer of all time, and will be invaluable to every one interested in this branch of astronomy for the indefinite future. The printing is clear and the size of the type good. The two volumes in which it is contained are of equal size and will be most convenient to handle. The Carnegie Institution is to be congratulated on their wisdom in assuming the financial burden of its publication.

CHAS. P. OLIVIER

FLOWER OBSERVATORY,
UNIVERSITY OF PENNSYLVANIA

Life-Histories of the Frogs of Okefinokee Swamp, Georgia. North American Salientia (Anura) No. 2. BY ALBERT HAZEN WRIGHT. The Macmillan Company, New York. xv–497 pp., 45 plates, $8.00. 1931.

DR. WRIGHT, in his well-known first book (1914) on the North American frogs, gave us detailed life histories of the eight forms common at Ithaca, N. Y. In this second and larger work, he adds the life histories of sixteen Southeastern species and one Northern one. The headings for each species indicate the scope of the treatment: scientific name, common name, range, general appearance, measurements, habitat, first appearance, general habits, voice, mating, ovulation, eggs, hatching period, mature tadpole, larval period, transformation growth, food, autumnal disappearance, affinities, bibliography.

The treatment, for the species studied, is all that can be desired. In especial, commendation is due for the method of quoting all the previous statements about each form, so that this book contains all the scattered information (sometimes somewhat contradictory) about each form. Naturally, more recent observations have more weight, yet it is not necessary to go beyond the pages of Dr. Wright's book to see what the older naturalists said, since he has included their remarks. To some this may seem a defect, as early observations are given the same apparent weight as later ones, yet to the reviewer it seems the only proper way of reporting habits.

Dr. Wright has laid himself open to criticism from certain quarters on account of his extreme conservatism in regard to matters strictly taxonomic. He undoubtedly knows more about these frogs than any one else. Why, then, has he not made more definite pronunciamentos as to affinities, synonyms, etc.? The reviewer thinks that the answer is clear, and also thinks Dr. Wright should be complimented rather than blamed for this apparent omission. The title of the work is "Life-Histories." Dr. Wright has chosen to do life-history work, and he has done it extraordinarily well. To criticize his work because he did not do a quite different piece of work, is, to the reviewer's mind, uncalled for and unjust. There are more good systematists in this country than there are good workers on life histories, and while the present work is not a systematic treatise, it doesn't pretend to be, and that is one of its chief virtues.

The title is slightly misleading. While most of the species are from the Okefinokee, *Rana sphenocephala* is not, yet no one will quarrel with its inclusion. *Hyla versicolor* and *Rana clamitans* were treated in his work on Ithacan species, yet they are definite Okefinokee forms.

The life-histories of *Pseudacris nigrita, P. ornata* and *P. occidentalis* are really not given with anything like the completeness of the other species included. Since his Ithacan paper only briefly touched on a northern Pseudacris, there is a big gap in eastern frog life-histories to be filled, the only well-known one being *P. ocularis,* which Dr. Wright has treated exhaustively in this paper.

Pseudacris aside, there remain from the eastern region the following frogs whose life-histories are relatively unknown, or at least not described with the wealth of detail and the accuracy given by Dr. Wright: *Scaphiopus holbrookii albus, Bufo fowleri, Eleutherodactylus ricordii, Hyla cinerea evittata, Hyla avivoca* and *Acris crepitans.* These with the various Pseudacris are mostly rare, local or problematical forms.

One hopes that Dr. Wright will eventually deal with these with the same care and skill with which he and he alone (save for *Hyla andersonii*) has made us acquainted with the life-histories of the other eastern forms.

E. R. DUNN

HAVERFORD COLLEGE

SCIENTIFIC APPARATUS AND LABORATORY METHODS

A DEVICE FOR FOCUSSING THE DISSECTING MICROSCOPE WITH THE FOOT

EVERY one who has done much work with a dissecting microscope has doubtless felt the need of a third hand for use in focussing as the object under dissection sinks down or springs up. A good hold on an elusive object often must be relinquished to enable one to focus on the object, which may be pushed out of focus again when work is begun on it.

For some years I have been urging on various

makers of microscopic apparatus the need of a foot-focussing device, with the result that one manufacturer has promised to design such an accessory at an early date. In the meantime I have developed a device which is very useful and fulfils most of the requirements which I had laid down for such a contrivance. A small screw-clamp, such as is used for rubber tubing, was fastened on the lower part of the rim of the focussing wheel of a wide-field binocular microscope. To this clamp a strong, smooth cord was attached which was passed upward and back over the wheel in a groove which the maker had provided, conveniently, though for what purpose I have no idea. The cord was lowered from the wheel to the floor, where it was attached by a screw-eye to the end of a light piece of wood about 2½ inches wide and one foot long. The length of the cord was adjusted so that one end of the wood pedal was lifted about 2½ inches from the floor, while the other end rested on the floor and served as a pivot. When the pedal was pushed downward the cord pulled on the wheel so as to turn it and raise the objectives. Downward movement was secured by passing a rubber band of proper strength under the stage of the microscope and fastening it above the stage to an adjusting screw on the inside of the arm. The microscope used has such a screw, so placed that it holds the rubber band well back from the stage where it does not interfere with the examination of large objects, or the use of dissecting trays. With a little alteration the same scheme could be used on other microscopes which do not have a screw on the inside of the arm. Most of the common types of binoculars have the groove in the focussing wheel which serves as a pulley for the cord.

This arrangement provides a sufficient range of focus for ordinary work, and where the objective needs to be raised higher the clamp can be set further around on the wheel. If the rubber band is not too strong the tension needed to hold the microscope in focus is slight, and the effort made is scarcely greater than that of pressing down the accelerator on an automobile. The heel is rested on the floor and the ball of the foot placed crosswise of the pedal at the point found most convenient.

For safety the microscope may be fastened to the table by a small clamp, but this is not essential if the apparatus is properly adjusted and the microscope well oiled. The cord rarely jumps from the wheel and when it does can be replaced in an instant. Unless the microscope is set so as to project a little over the table the cord will rub against the edge of the table, but this does not interfere with the working of the device.

Either foot may be used, and the cord may be attached on either the right or the left side of the microscope, as desired. The apparatus has several advantages. It may be made in a few minutes from supplies available everywhere, and may be attached to or detached from the microscope in a minute. It may be used on any table without marring it in any way. Adjustment to tables of different heights merely involves a change in the length of the cord.

CARL D. LA RUE

DEPARTMENT OF BOTANY,
UNIVERSITY OF MICHIGAN

AN IMPROVED SODIUM BURNER[1]

EXPERIENCE here over a period of several years has revealed the need for an improved sodium burner for use in polarimetry. Burners which have been previously described, or used here, are open to the objections that the light is either too small in size, or that its intensity is inadequate or of insufficient duration. A fairly satisfactory type of burner is that of Caldwell and Whymper,[2] who passed gas through a mixture of salt and sand into a blowpipe for combustion with air. This burner was improved by West,[3] who devised a glass burner with a salt reservoir for introduction of the salt by tapping. Making use of the most obvious advantages of the burners of Caldwell and Whymper, and of West (introduction of powdered salt into the gas flame) we have devised the improved sodium burner shown in Fig. 1. By the action of an electrically driven vibrating unit against the bottom of a funnel salt is introduced into the flame of this burner. The burner is capable of producing a very intense light at the will of the operator. This action at a distance of several feet from the observer permits readings with an intensified light without fatigue of vision caused by direct tapping.

The salt funnel (C) is of brass and 50 mm. square at the top, which contains a filling cap. The bottom of the funnel is grooved and sloped to the opening into the mixing chamber (B), which contains inlets of metal tubing for gas and air. The opening into the mixing chamber may be cleaned through the hole shown capped. The mixing chamber, also of brass, is 35 mm square and 40 mm in height, with a curved bottom and an opening of 20 mm at the top into the brass chimney (A), shaped as shown. This chimney (A) is 160 mm in height, of the Meker type, with a

[1] Contribution from the Department of Physiological Chemistry, Loyola University School of Medicine, Chicago, Ill. Demonstrated by the authors at the twenty-sixth annual meeting of the Federation of American Societies for Experimental Biology, in Philadelphia, April 28, 1932. The burner described in this paper was constructed with the kind cooperation of Messrs. E. H. Sargent and Co., Chicago.

[2] R. J. Caldwell and R. Whymper, Proc. Roy. Soc., (A) lxxxi, 112.

[3] E. S. West, *Jour. Lab. and Clin. Med.*, 14: 267, 1928.