# JOURNAL OF THE

## Tennessee Academy of Science

| VOLUME XXXI  | No. 4 |
|--|-------|
|  |       |
| CONTENTS   |       |
| The Need for Antibiotic Free Diets in the Experimental Infection of Animals. Richard T. Ross, D. Frank Holtman, and Robert F. Gilfillan  | PAGE  |
| Studies of Nevada Ants III. The Status of Formica  | 400   |
| nevadensis Wheeler (Hymenoptera: Formicidae). A. C. Cole   | 256   |
| IV. Descriptions of Sexual Castes of Three<br>Members of the Rufa Group of the Genus   |       |
| Formica L. A. C. Cole  | 257   |
| New Synonymy in the Genus Manica Jurine (Hymenoptera: Formicidae). A. C. Cole  | 260   |
| News of Tennessee Science. Carl Tabb Bahner  | 262   |
| Status of the Raccoon in Tennessee. Vincent Schultz_   | 269   |
| Status of Red and Gray Foxes in Tennessee.  Vincent Schultz  | 26    |
| A Study of the Mourning Dove Mortality in the Southeast. Vincent Schultz   | 27!   |
| Variations in Hymenolepis serrula Oswald, 1951,<br>(Cestoda: Hymenolepididae), a Cestode from the<br>Smoky Shrew, Sorex fumeus Miller, 1895, with<br>Special Reference to Three Geographic Areas.<br>Danny D. Cox, Honorico Ciordia, and |       |
| Arthur W. Jones  | 287   |
| For The High School Science Teacher,  John T. Johnson  | 300   |
| Academic Preparation of Tennessee High School<br>Chemistry Teachers. Lone L. Sisk  | 300   |
| Water Analyses as an Aid to Geochemical Prospecting for Zinc in East Tennessee. F. Donald Bloss  | 306   |
| Organization and Progress of the Tennessee Highway Research Program. W. A. Goodwin   | 319   |
| County Records of Testudinata Collected in Georgia.  James C. Knepton  | 329   |
| Index to Volume XXXI, 1956   | 325   |

### **JOURNAL**

### Tennessee Academy of Science

#### EDITORIAL STAFF

JESSE M. SHAVER, Editor Emeritus, George Peabody College for Teachers, Nashville

HELEN L. WARD, Editor, University of Tennessee, Knoxville CARL TABB BAHNER, News Editor, Carson-Newman College, Jefferson City A. C. Cole, Zoology Editor, University of Tennessee, Knoxville E. D. EAVES, Mathematics Editor, University of Tennessee, Knoxville WM. A. GOODWIN, Engineering Editor, University of Tennessee, Knoxville CARL M. Hill, Chemistry Editor, Tennessee A and I College, Nashville WENDELL HOLLADAY, Physics-Astronomy Editor, Vanderbilt University, Nashville

W. B. JEWELL, Geology-Geography Editor, Vanderbilt University, Nashville JOHN T. JOHNSON, High School Editor, Young High School, Knoxville ELSIE QUARTERMAN, Botany Editor, Vanderbilt University, Nashville

Entered as second class matter at the post office at Knoxville, Tennessee, under Act of August 24, 1912, acceptance of mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, and authorized September 16, 1931.

Published quarterly, in January, April, July, and October, by the Tennessee Academy of Science at Knoxville, Tennessee

The Journal is sent to all members not in arrears for dues. The subscription price is \$2.00 a year, invariably in advance. Single copies 75c.

All articles and communications for publication, books and publications

for review, should be addressed to the Editor.

New subscriptions, changes of address, and applications for membership should be addressed to the Secretary. Personal items, news of events in the scientific world, and other notes suitable for our "News of Tennessee Science" department should be addressed to the News Editor.

#### THE TENNESSEE ACADEMY OF SCIENCE

(Founded 1912, at Nashville, Tennessee) Affiliated with the American Association for the Advancement of Science

AFFILIATED SOCIETIES Tennessee Ornithological Society, Nashville, Tennessee Barnard Astronomical Club, Nashville Tennessee Science Teachers Association Tennessee Psychological Association

**OFFICERS** 

CLAUDE S. CHADWICK, President, George Peabody College for Teachers, Nashville

ISABEL H. TIPTON, President-Elect, University of Tennessee, Knoxville JESSE M. SHAVER, Editor Emeritus, George Peabody College for Teachers,

HELEN L. WARD, Editor, University of Tennessee, Knoxville DONALD CAPLENOR, Secretary, George Peabody College for Teachers, Nashville HARRIS J. DARK, Treasurer, David Lipscomb College, Nashville

The Tennessee Academy of Science is very anxious to include in its membership all teachers and professors of science, research workers in science both in educational institutions and industrial establishments, and all others who are interested in some phase of science. We invite you to join our organization and take part in our activities. The annual dues are: \$3.00 for members and \$10.00 for sustaining members. They may be sent direct with your application for membership to the secretary.

#### SMALL PLANKTON TOWING NETS

These economical nets are very generally used in

both marine and fresh-water collecting.

Like our standard towing nets, these are made of imported silk bolting cloth, but they are of smaller size. The phosphor-bronze ring is 6 inches in diameter, and the bolting cloth bag is of conical shape and is 16 inches deep. Each net is equipped with stainless steel pull wires

| and non-rusting swivel.          |        |
|----------------------------------|--------|
| 105A401 Very Coarse. No. 0 Mesh, |        |
|                                  | \$5.50 |
| 105A411 Coarse. No. 6 Mesh,      |        |
| 74 meshes to the inch. Each      | 6.75   |
| 105A421 Standard. No. 12 Mesh,   |        |
| 125 Meshes to the inch. Each     | 8.50   |
| 105A431 Fine. No. 20 Mesh,       |        |
| 173 meshes to the inch. Éach     | 11.50  |
|                                  |        |

#### GENERAL BIOLOGICAL SUPPLY HOUSE

Incorporated 8200 South Hoyne Avenue Chicago 20, Illinois

### CAROLINA CULTURES

| A Dependable Culture Service |  |              |        |        |        |  |  |
|------------------------------|--|--------------|--------|--------|--------|--|--|
|                              | Class of:  | 25           | 50     | 75     | 100    |  |  |
| L1                           | Giant Amoeba proteus(standard for study)   | \$2.00       | \$3.50 | \$4.75 | \$6.00 |  |  |
| L2                           | Paramecium multimicronucleatum (giant form; excellent for laboratory study)                  | 1.50         | 2.50   | 3.25   | 4.00   |  |  |
| L220                         | Planaria maculata or dorotocephala (maculata, light colored species, is generally preferred) | <b>2</b> .00 | 3.50   | 4.75   | 6.00   |  |  |
|                              | SAME DRICE AS AMOR   | TD A .       |        |        |        |  |  |

SAME PRICE AS AMOEBA:
Stentor Peranema Spirostomum Eudorina
Vorticella Volvox Chlamydomonas Pandorina P. caudatum P. aurelia Actinosphaerium Desmids Pelomyxa Mixed Protozoa Hydra

SAME PRICE AS PARAMECIUM: Euplotes Copepou Chilomonas Centropyxis Euglena Copepods Spirogyra Elodea Nitella Rotifer Arcella Daphnia Rotifers Vinegar Eels Oscillatoria

To expedite handling at transfer points in transit all living cultures are shipped Special Delivery same day received, or according to customer's shipping schedule. The above prices include container. Postage and Special Delivery are charged to the customer. For Drosophila cultures, Tenebrio or "Meal-worms," Aquarium Sets or Assortments, living Frogs, Turtles, Rats, Mice, etc., see our Catalogue number 18

Catalogue number 18.

Cultures of Bacteria and Fungi are also available.

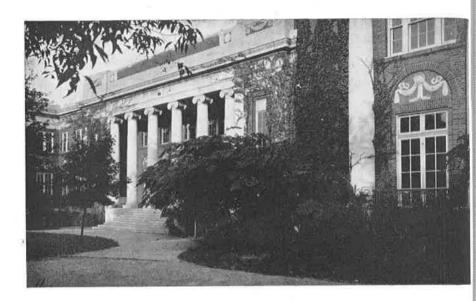
We have a complete line of Preserved Specimens, Microscope Slides, Kodachromes, Dissecting Instruments, etc. Our publications—CAROLINA TIPS and Catalogue number 18—will be sent free upon application.

CAROLINA BIOLOGICAL SUPPLY COMPANY Elon College, North Carolina

# A SCIENCE CURRICULUM

Especially Arranged For Preparing Teachers of Science

The prospective teacher may get a minimum of three years in one science (Biology or Chemistry), two years in a second science, and one year in the third science, with the courses in Psychology and Education required for a teaching certificate, including practice



teaching in science. Graduate work through the master's degree given in biology and chemistry in order to prepare teachers for the larger high schools or for teaching positions in small colleges.

Write for catalogue mentioning the field of your interest to

THE SECRETARY

### GEORGE PEABODY COLLEGE FOR TEACHERS

NASHVILLE 5, TENNESSEE